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A STUDY OF STRATEGY USE, STRATEGY VARIATION AND STRATEGY ABSENCE IN THE TASK APPROACH OF LEARNING DISABLED ADOLESCENTS WITH ORGANIZATIONAL PROBLEMS

BY

GLADENE ROBERTSON

(C)

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH
IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE
OF DOCTOR OF PHILOSOPHY

IN

SPECIAL EDUCATION

DEPARTMENT OF EDUCATIONAL PSYCHOLOGY

EDMONTON, ALBERTA

SPRING 1987

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Gladene Robertson
(Student's signature)

Department for the Education of
Exceptional Children,
College of Education,
University of Saskatchewan
Saskatoon, Sask.
S7N 0W0

Date: April 18, 1987

THE UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommended to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled **A STUDY OF STRATEGY USE, STRATEGY VARIATION AND STRATEGY ABSENCE IN THE TASK APPROACH OF LEARNING DISABLED ADOLESCENTS WITH ORGANIZATIONAL PROBLEMS** submitted by **Sandra Gladene Margaret Robertson** in partial fulfilment of the requirements for the degree of **Doctor of Philosophy** in **Educational Psychology in Special Education.**

P. Mulcahy
Supervisor

L. McGrath

M. L. Jenkinson

J. W. Chapman
External Examiner

Date: December 8. 1986

To my father, sister and friends whose encouragement and love have seen me through the times when my own strength wained

and

To the memory of my mother and her dreams for me.

ABSTRACT

Research into the specific nature of the task approach of inefficient learners has been limited, despite the proliferation of studies which investigate various approaches to teaching poor strategy users to become efficient students. The intent of the present study was to provide detailed qualitative information on the nature of inefficient learning. Four tasks and thirty interview probes were vehicles for pursuing the research questions. The primary purpose of the tasks was to provide opportunities to observe spontaneous strategy use, elicited strategy use and strategy absence. Tasks included a Piagetian task, a study skill, an errand planning task and an exercise sensitive to frontal lobe dysfunction. A twenty-one item questionnaire modelled after Luria's definition of conscious activity, which included questions on planning, inspection, regulation, verification and correction as well as general organizational skills, was utilized. In addition, a nine-question interview guide elicited information regarding the subjects' knowledge and feelings about their abilities and study habits.

Subjects were seven male adolescents ages 14 to 19 who were designated as learning disabled and who exhibited organizational problems. Poor organizing skills were determined on the basis of teacher nomination and a teacher-completed questionnaire. The methodology employed included structured participant observation and interview techniques. The data analyzed were the words and actions of each subject. Recordings of data were made on video and audio tape. Transcriptions and subsequent data reduction yielded themes which were examined in terms of the subjects' specific and general knowledge of their study habits and their awareness of how they regulated their learning.

Strategy deployment and metacognitive descriptions were compared in case study formats. Trends and patterns resulted in the formation of grounded speculations: the ability to correctly judge the efficiency of the task approach of another and the ability to verbalize the concept behind the use of a preferred strategy does not insure the ability to implement the strategy; students may have accurate knowledge of their own strategy weaknesses; self-directed manipulation of materials can generate increased knowledge; some underachieving students may blame themselves for their failures; teachers in academic and less academic settings view students' organizational skills differently.

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CHAPTER I

INTRODUCTION

Order is inherent in every aspect of our universe. Much of that order can be defined in terms of natural laws basic to the interrelationships among the various elements of matter and to biological codes which govern the survival of an individual species. The physical laws which apply to nature cannot be ignored without consequence, whether that consequence be immediate or long-term. Hence, predictability of the outcome of an event grows out of the discovery of order. The individual human being, existing in a world which is governed by a myriad of rules composed of the rigid natural laws already discussed, and the more variant standards of unique close environments, reacts to and learns from his surroundings according to rather predictable principles which may be examined and recorded.

Many approaches have been used in examining the "thinking" behaviours of human beings as they interact with and learn in their environments. Resulting from these observations and experiments are a number of theories which attempt to explain the human behaviour most generally exhibited as individuals encounter and work through various tasks and problems. For example, "Gestalt theory claims that there exists in the organism an inherent tendency to apprehend and respond to organized configurations and that this tendency to impose structure is a basic principle of psycho-physiological function" (de Hirsch and Jansky, 1980, p. 227).

Mayer (1977) outlines several schools of thought regarding thinking and learning, which are: thinking based on learning by reinforcement; thinking involving forming and testing hypotheses; thinking involving the restructuring of elements of a problem in a way which differs from the original presentation; thinking which relates new problems to ideas or experiences already familiar to the person; thinking as compared to the sequence of internal changes in information that progress toward a goal; and thinking as dependent on how an individual represents the world and in what ways a person can manipulate or act upon the internal representation.

Whether one adheres firmly to one theory of learning or acknowledges several possible explanations, there is general agreement that there are complex observable learning patterns which are influencd by a range of variables. The ways in which an individual approaches learning experiences may be nondirected or haphazard originally, but techniques revealing plans and strategies usually evolve from these experiences. Such organized approaches to tasks usually result in more efficient and successful learning, encouraging the learner to employ them again in subsequent situations. There is a "sense of order" which comes from experiencing an event repetitively, which is absent when there is variance from the expected pattern. The efficient learner, when faced with a situation of this kind, may look for aspects of the new task to which old strategies may be applied, or seek out new strategies and thus devise methods of carrying out an activity effectively or solving a problem successfully. Such ability to regulate and control the learning process is more indicative of the approach of the experienced than the novice learner (Brown and DeLoache, 1978). However, given activities which are sufficiently difficult or unfamiliar, the older, more experienced individual may perform much like the beginner. "Ignorance is not necessarily age-related; rather, it is more a function of inexperience in a new (and difficult) problem situation. Adults and children display similar confusion when confronted with a new problem" (Brown, 1980). Apart from those who have not learned because they are too young and those who have not learned because of lack of opportunity, there is a third group: those who, despite seemingly adequate developmental readiness and suitable environmental opportunity, have not learned as they might be expected to learn.

THE TARGET GROUP AND THE ISSUES

Of interest, then, are those individuals who do not seem to benefit from the same experiences which refine the task approach of "normal" learners. They remain the "novices" despite repeated opportunities to respond in situations with basic similarities. In these individuals, there appears to be a diminished ability both in perceiving and in responding to order inherent in the world around them. As well, they experience difficulty imposing order on any event which is out of position or step with the expected.

Those lacking in a spontaneous application of efficient strategy may be taught to use a more effective approach (Brown and Palincsar, 1982). Feuerstein (1979, 1980) has developed techniques and programs to help those students who have failed to develop the ability to learn and to solve problems (Hobbs, 1980). Meichenbaum (1977) has long been a proponent of the student learning to modify his or her cognitive approach to gain greater efficiency and success. Meichenbaum's theory of cognitive behaviour modification promotes the importance of the student learning to understand and regulate his behaviour (Meichenbaum and Goodman, 1971; Meichenbaum and Asarnow, 1979). It is important to consider, however, that some researchers have found qualitative differences in the task approach of the spontaneous users of efficient strategies and those who are taught to impose strategy (Brown and DeLoache, 1978). Other studies have shown that a comparatively more efficacious task approach may be engendered in learners, not by direct teaching but by providing demonstrations of various strategies and asking students to judge the best approach (Stone, 1980).

Another issue which becomes important in studying strategy-use and regulation of strategy-use is the question of generalization or transsituational application of strategy. There is, of course, a developmental aspect to this phenomenon: with young children frequently constrained by context and adults able to make wide application of their acquired repertoire of rules and regulations (Brown, 1982). According to Brown, Campione and Day (1981), students experiencing academic difficulty also often fail to generalize strategies from task to task and must be taught how to generalize. Thus the phenomenon of the experienced remaining the novice continues unless intervention contains a balance of specific and generalized strategy (Brown and Palincsar, 1982).

Although it is presently in vogue to study strategy training, little work has focussed on the specific individual approaches of inefficient learners as they complete tasks. Some research in the area of reading has been undertaken in attempting the classification of the strategies involved in comprehending text. In such studies, students read paragraphs and select one statement from a number of sentences to show that they have read with comprehension. Verbal protocols are examined and responses classified according to a previously designed system (Kavale, 1980) or, more acceptably, to a classification system derived from the nature of the response (Olshavsky, 1976-77). Other researchers, while not limiting themselves to the inefficient learner, have investigated the individual differences which exist when subjects approach tasks. Such studies involved problem-solving situations (Simon and Simon, 1978) and social planning tasks (Goldin and Hayes-Roth, 1980).

What seems to be lacking in the literature is a study or series of studies which limit the population being investigated to a group of inefficient learners who, despite the usual life and school experiences, have remained novices at task approach and problem solving. Studies which examine the behaviour of such students on a variety of tasks, such as those reflective of stages of cognitive development, those typical of school assignment, and those involving life-skill and social knowledge would add to the present meager understanding of what inefficient learners do and do not do. It is unlikely that, in carrying out such studies, a homogeneous pattern will develop which may be said to be common to all inefficient learners. However, if sufficient detail is gathered on the subjects observed, it may be possible, over time, to begin to delineate specific subgroups within this larger group of subjects.

The type of in-depth research necessary to gather such information represents a departure from much of the available literature which discusses inefficient learning of one kind or another. Utilizing large samples of poor and efficient learners and comparing the two groups on a task will often provide statistical proof of learning differences. However, smaller samples of subjects, who are chosen according to rigid standards and whose task performance is carefully documented, may provide valuable contributions to our knowledge of the composite inefficient learners. Kurland and Campione (1982) have said, ". . . we should focus more of our research efforts on developing a fuller understanding of a few exceptional children rather than persisting with studies of ill-defined subjects" (p.2).

In terms of the current research, the first step in such a focussing was to clearly define the group of inefficient learners to be investigated. The present study sought to observe students of average to above average intelligence for whom some aspect of academic learning had been difficult. The literature has, since the mid-1960's, referred to such children as the learning disabled. The current most popularly accepted definition is from the Education of All Handicapped Act of 1974, which utilizes the National Advisory Committee Definition of 1968:

> "Specific learning disability" means a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, which may manifest itself in an imperfect ability to listen, think, speak, read, write, spell, or to do mathematical calculations. The term includes such conditions as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia. The term does not include children who have learning problems which are primarily the result of visual, hearing, or motor handicaps, or mental retardation, or emotional disturbance, or of environmental, cultural, or economic disadvantage. (U.S. Office of Education, 1977a, p. 42478) (Cartwright, Cartwright, and Ward, 1984, p. 193-194)

It is clear from examining the above definition that, even after limiting the population to the learning disabled, one is still faced with a heterogeneous population with widely varying problems. Torgeson (1982b) has advocated research based on rationally defined subgroups to help to overcome the diverse nature of the sample under investigation. For the purposes of the present research, the subgroup which formed the focal point of the study were learning disabled students with organizational difficulty.

Organizational difficulty may be clarified by examining the steps involved in an organized act. Luria (1973b), for instance, describes the organization of conscious activity as including aspects of programming, regulation and verification of activity. More precisely, he breaks the organization into a step-by-step procedure:

> Man . . . creates intentions, forms plans and programmes of his actions, inspects those performances and regulates his behaviour so

> that it conforms to those plans and programmes, finally he verifies his conscious activity, comparing the effects of his actions with the original intentions and correcting any mistakes he has made. (p. 79)

For the purposes of the present study, a sequence of key words from Luria's descriptor were identified. They were: intention created, plan formed, inspection of performance, regulation of behaviour, verification of activity and correction of mistakes. These key words formed a framework from which behavioural statements evolved. The resultant statements were then used in interviewing teachers regarding students' behaviour and as part of structured dialogues with students in order to probe their metacognitive awareness of their organizational ability. With less rigor, the key words were also used as one model by which verbal protocol and movement patterns were analyzed in an attempt to complete an in-depth study of task approach.

Luria's (1973a, 1980) discussions of the organization of conscious behaviour are part of his description of the role of the frontal lobes in the regulation of mental activity. The similarities between the behaviours of patients with frontal lobe lesions and inefficient students who find difficulty in regulating their behaviour in a goal-directed manner are striking. Brown and Palincsar (1982) have recognized the value of investigating these characteristics:

> Poor problem solvers lack spontaneity and flexibility in both preplanning and monitoring. Extreme examples of planning

> deficits are described in the clinical literature on patients with frontal-lobe syndrome. Such patients typically omit the initial preaction component (Luria, 1966); they also experience extraordinary difficulty with error correction (Milner, 1964). Such patients have been described as simultaneously perseverative and distractible; they exhibit a failure in intelligent focussing, which is attributed to damage to the supervisory attentional mechanism or executive system (Norman & Schallice, 1980). Many descriptions of learning disabled children's problem solving are very similar: this similarity deserves attention. (Brown and Palincsar, 1982, p. 2)

The regulatory or executive function of the frontal lobes permits what Luria (1973b) refers to as the "formation of active behaviour directed towards the future" (p. 91). Executive processes such as those of predicting, planning, checking and monitoring are believed by Brown (1977) to underlie the cognitive products of the learner and to be "the basic characteristics of efficient thinking in a wide range of learning situations" (p. 98). Thus, a study which is centered on an intense, qualitative description of students' knowledge of and use of their own executive powers should add to an understanding of what task approaches are particularly inefficient and why they are unproductive.

Concern regarding a student's ability to carry out work assignments independently may be present in his elementary school days, but that worry quite naturally intensifies as the student becomes older and more self-direction is expected of him. Organizational difficulties in adolescents are discussed in the literature as they relate to inability to learn from external organization, which is observed daily in the classroom, as well as in carrying out assignments in an organized fashion (Deshler, 1979). Error monitoring in schoolwork by learning disabled adolescents has been discussed by Deshler, Ferrell and Kass (1978). Blalock (1981) describes the persistence of organizational problems as they extend into the adult years of the learning disabled individual and acknowledges that the implications of such problems to life beyond the classroom doors are significant: "Organizational problems were complained about very frequently and interfered most with writing papers and performing adequately on the job" (p. 45).

The persistence of organizational difficulty beyond childhood is not in itself sufficient reason for choosing an adolescent population to study. At least two other factors have focussed the present study on the adolescent. The first consideration is that it is probable that we cannot expect independently organized strategic behaviour of a more sophisticated nature until late childhood or early adolescence. Choosing students of at least fourteen years of age, for example, yields the opportunity to observe the emergence of a specific strategy which is not present in younger children. According to Stone (1980), while only thirty-two percent of the eleven-year-olds he has studied demonstrated the ability to spontaneously employ a particular Piagetian strategy during an experiment, sixty-five percent of the fourteen-years-olds could do so. Brown (1980) describes the same importance of developmental factors in planfulness: "planful strategic behaviour in the face of school-type tasks does appear to be relatively late in developing" (p. 457). It is also believed that the use of adolescent subjects would make the employment of verbal protocol analysis more fruitful. Flavell (1976) has applauded procedures which attempt to find out what the child is thinking as he works, but points out that "interrogation procedures are likelier to be productive with older than younger subjects . . ." (p. 234).

THE INTENTION

The present study was designed around the intention of pursuing an intensive investigation of the behaviour and verbalizations of learning disabled adolescents as they attempted a series of tasks. The research paradigm was a case study approach which utilized a variety of techniques, including: focussed in-depth interviews (Denzin, 1970); open-ended questioning and attempts to elicit strategy through demonstration (Stone and Day, 1978; Stone, 1980); verbal protocol analysis (Goldin and Hayes-Roth, 1980) and data condensation (Giorgi, 1975).

Four tasks and two interviews were utilized. The primary purpose of the tasks was to provide vehicles by which to observe spontaneous and elicited use of strategy. Each task was to contribute a unique opportunity to view specific types of strategy or to provide variant contextual settings in which strategy might be employed. For example, the Rods Task was designed to show the subject's adeptness at the use of the control-of-variables strategy which would reflect the presence of formal operational thought structures (Inhelder and Piaget, 1958; Stone, 1980). The Text Search Task provided an everyday school-related assignment which was structured to reveal the subject's approach to a basic information-gathering study skill. The Errand Planning Task placed the subject in the position of planning a series of errands within a specified time frame. Finally, the Self-Ordered Task presented a planning and monitoring exercise which was sensitive to the right and left frontal lobe dysfunctions.

Extensive information in regards to each subject's processing and academic skills was gathered so that task performance on the four main tasks could be compared to underlying skills. Subjects were learning disabled adolescents who exhibited organizational problems. Poor organizing skills were determined on the basis of teacher nomination and a teacher-completed questionnaire. Task performance was recorded on video and audio tape for further transcription and analysis. Emphasis was on gathering detailed qualitative descriptors of the students' task approaches as well as recording their metacognitive perceptions of their strategy use. Comparisons were made in individual performances across tasks and, insofar as was possible with the small sample used in the present study, patterns of underlying skills contributing to varying strategic approaches were examined. Task behaviours were classified according to already established criteria (Hayes-Roth and Hayes-Roth, 1979; Luria, 1980; Day and Stone, 1980) and by systems which were generated by the nature of the emerging data.

CHAPTER II

SELECTED REVIEW OF THE LITERATURE

INEFFICIENT LEARNING

Children with adequate intellectual abilities, who do not learn despite receiving the same educational opportunities as their achieving peers, have long been of interest to those who study human behaviour. The underlying reasons for the failure of these children to meet expected educational standards are as variant as cognitive processing is complex. There has been a tendency within recent years to take a less focal view of the range of possibilities contributing to failure, and an increasing willingness to entertain the place of "regulating" as well as "processing" cognitive functions in learning difficulty. It is becoming apparent that inefficient and efficient learners do differ, not only in skills involving attention, perception, memory, symbolization and conceptualization, but in their knowledge about cognition and in their ability to regulate cognition (Brown, 1977; Brown, Campione and Barclay, 1979; Brown, 1982; Brown and Palincsar, 1982; Forest-Pressley and Waller, 1984; Reeve and Brown, 1985; Wong, 1985).

It appears that, along with the academic difficulties they experience, an unknown portion of the learning disabled population do not approach tasks with functional efficiency. They do not seem to know "what to do" or "how to do" or "when to do" as they are required to move from an instruction which sets a goal to the successful completion of that goal. They are frequently even more baffled by tasks which require them to set their own intention and then carry through to the completion of that task. Swanson (1982) has said that "an important assumption is that the rules and specific strategies employed by learning disabled children do not appear to tap or exhaust their intellectual capacities" (p. x).

STRATEGIES FOR ORGANIZED BEHAVIOUR

The punch line of an old vaudeville routine went something like: "Sorry, but you can't get there from here." Those words, or ones similar to them, are often spoken without comedic intent by a number, perhaps even a subgroup, of learning disabled students when they are confronted by assignments which their peers may find to be quite straightforward. These are the students who appear to be disorganized and lacking in strategic approaches to their work, and who may have difficulty formulating and executing even the simplest of plans.

Recognized by teachers and clinicians for many years, these individuals have, until very recently, escaped any in-depth investigation. Textbooks written on the subject of learning disabilities have traditionally contained references to organizational problems in this population. Unfortunately, these references frequently form part of a list of the hetrogeneous behavioural or cognitive traits of the learning disabled rather than being part of an expanded discussion (Mercer, 1979; Cartwright, Cartwright and Ward, 1984; Lerner, 1985). However, more detailed examination of task approach of the disorganized student now exists in a variety of research areas. Segments of the literature on problem solving (Mayer, 1977; Havertape & Kass, 1978; Maker, 1981) are as important to forming a comprehensive viewpoint on strategy as are aspects of recorded study on metacognition (Brown, 1977; Hagen, Barclay & Newman, 1981; Reeve and Brown, 1985); study skills (Cronin and Currie, 1984); and cognitive interventions (Deshler, Schumaker and Lenz, 1984). Nonverbal behaviours require planning and monitoring (de Hirsch & Jansky, 1980; Blalock, 1981), and therefore the inclusion of this area of study can yield valuable information to an understanding of organizational abilities. Certainly the capacity or strategy debate (Swanson, 1982) has become a trendy issue in the literature in the learning disabilities field and promises to add to the understanding of the task approach of the inefficient learner, providing it does not become too dichotomous in nature.

Obviously, all topics related to strategy which are found in the literature have not been researched in equivalent depth. Strategies used in recall have been extensively studied (Flavell, 1970; Neimark, Slotnick & Ulrich, 1975), while certain aspects of imposed arrangement of unit structures in reading, for example, have been less exhaustively pursued (Oakan, Wiener & Cromer, 1971; Weaver, 1979).

Studies such as the ones discussed above provide at least two important services by elaborating upon accepted but minimally described terminology. First, they eliminate the tendency for readers and listeners to ascribe their own concepts to a label. One term, such as "organizational difficulty", might bear various connotations depending on the background or interest of the individual who encounters the descriptor. For one person the term might refer to a general disarray of personal possessions while to another it may indicate the lack of use of a specific strategy in completing academic tasks. A second advantage of carefully written, elaborated research is that it can make valuable contributions to our knowledge of variant strategy use by groups, and eventually subgroups, of the learning disabled. Such definitive information cannot be gathered in large studies intent only at looking at global differences between groups.

DEFINITIVE BEHAVIOUR

Alley and Deshler's (1979) work is indicative of a more elaborated behavioural description of the organizational problems of an age-defined group within the learning disabled population. They have said:

> 1. LD adolescents have difficulty perceiving organization in a set of materials, such as notes from class, class assignments, and the textbook.
>
> 2. LD adolescents usually do not appreciate the importance of organizing information.
>
> 3. LD adolescents do not realize that information can be manipulated or rearranged to produce an organized structure most consistent with the learner's style of understanding, storing, and using information.
>
> 4. LD adolescents have difficulty dealing with

an isolated task in an organized fashion.

5. LD adolescents have difficulty dealing with multiple tasks in an organized fashion.

(Alley and Deshler, 1979, p. 210)

It is not always clear from the results of studies investigating task approach just precisely what it is that the inefficient learner is doing when he is not doing what the efficient learner does. A cursory examination of the literature might lead one to believe that learning disabled students are inert when asked to complete activities. Terms such as "strategy absence" (Stone, 1980) or "no attack strategies" (Havertape and Kass, 1978) leave the impression of a void rather than a difference.

A closer look at the investigative work of the two researchers just referenced reveals both quantitative and qualitative differences between the strategies of the learning disabled and the normal groups compared. For example, in the Piagetian-based work of Stone and Day (1978, 1980), Stone (1980), and Day and Stone (1982), strategy absence means the failure to employ the control-of-variables strategy in three out of four trials of a specified task. Control-of-variables means that, when faced with testing many variables, all other variables are held constant while one variable is tested. Quantitative descriptors have centered around the emergence of spontaneous and elicited strategies as well; yet, these operational statements are based on the qualitative analysis of the behaviour of children. Specifically, their behaviour as they attempt to manipulate materials to arrive at a solution to an open-ended question.

Havertape and Kass (1978), in examining problem-solving techniques of learning disabled adolescents on school-related tasks, describe what they term "deficient strategies" as those which consist of random or impulsive answers without any relationship to the problem requirements" (p. 98). They also quantified a series of descriptors so that they could statistically compare learning and non-learning disabled sample groups.

Student verbalizations were analyzed according to a three-step classification system. Each step in turn has a number of levels of proficiency against which the transcriptions of the students' words could be matched. An outline of the Havertape and Kass (1978) classification system follows:

Step One: Getting the information

5 Reads problem correctly
4 Reads problem correctly with effort
3 Rereads problem several times
2 Reads only parts of the problem
1 Does not read the problem

Step Two: Understanding the Problem

3 Verbalizations show understanding of problem with correct solution
2 Verbalizations show understanding of problem with incorrect solution
1 Verbalizations show lack of understanding with incorrect solution

Step Three: Solving the Problem

7 Uses logical and efficient steps with no error
6 Uses logical and efficient steps but with error(s)

> 5 Uses logical and inefficient steps with no error
> 4 Uses logical and inefficient steps with errors
> 3 Begins logical procedure but does not finish problem
> 2 Verbalizes inability to solve problem and does not guess
> 1 Answers problems or proceeds in solution randomly or impulsively. (p. 98)

Havertape and Kass (1978) found differences between learning disabled and normal students at all three levels of their classification system. When "getting the information" (Level 1), only one third of the learning disabled students read problems efficiently. Twenty-five percent did not bother to read the problem at all. Sixty percent of the learning disabled students did not know what was needed or showed they did not understand the problem (Level 2). When solving the problem (Level 3), forty percent of the learning disabled subjects gave random and impulsive answers which did not show a relationship to the requirements of the problem. Havertape and Kass (1978) found that "The learning disabled students who arrived at answers, sometimes correct, used haphazard thought processes" (p. 98).

Studies which attempt to look at subgroups within more widely defined groups are rare outside of the neuropsychological literature, but they are emerging. Stone (1980) and Day and Stone (1982) have investigated specific strategies across age groups and attempted not only to classify performance but to look at the underlying skills of subgroups falling into various classifications.

DEVELOPMENTAL AND PROCESSING FACTORS IN STRATEGY USE

In attempting to gain information on the deployment of strategy, it is important to consider the changes in task approach which occur as children mature. Cognitive development plays an important role in how children deal with the variables which they encounter in explaining certain phenomena (Lunzer, 1968; Stone, 1980; Axia and Nicolini, 1984).

Research by Stone and Day (1978, 1980), Stone (1980), and Day and Stone (1982) forms part of a group of relatively recent studies which are examining the new linguistic and cognitive skills that develop in the years just prior to adolescence and in early adolescence. In particular, Stone has focussed his interest on thinking skills related to information gathering during the developmental period just mentioned. In referring to the initiation of his work, Stone (1980) has said:

> Like many others, we were dissatisfied with the utility of Piaget's structured-whole model of adolescent thought. We did think, however, that the problem-solving strategies which Inhelder and Piaget (1958) identified were important aspects of adolescents' approaches to problems. Therefore, like several others (e.g., Siegler, 1976; Linn, 1978), we have focussed on adolescent's use of these strategies themselves. (p. 86)

Stone and Day found that there were levels of availability of strategy use in the subjects with whom they worked. Some spontaneously used a control-of-variables strategy which could be defined as "directly symptomatic of the presence of formal operational thought structures" (Inhelder and Piaget, 1958, p. 1055). Others, although not using a control-of-variables strategy on the first trial, after a brief interaction, would demonstrate what Stone and Day (1978) refer to as an elicited strategy. Others, who did not demonstrate a formal operational strategy, were called the strategy absent group.

Stone (1980) found an increase in use of the control-of-variables strategy with age. While at age nine, 75 percent of the normal children had no access to the strategy, by fourteen years, 65 percent were using the strategy spontaneously and only one in ten did not show evidence of the strategy. He found further that although the control-of-variables strategy was not affected by many types of learning disabilities it was more likely to be absent in the LD adolescent than in the normal adolescent. As well, there appeared to be subgroups who had particular difficulty. Most glaring were those who showed significant variances in Verbal and Performance IQs as measured by the _WISC-R_ or _WAIS_. Average Verbal/Performance splits of 26 points existed for the Strategy Absent Group, while mean spreads of approximately 14 and 10 respectively were found for the Elicited and Spontaneous Groups. More precise identification of the nature of this group revealed that it did not matter in which direction the discrepancy lay and, further, that there were two distinct subgroups within the strategy absent group (Stone, 1980):

> One subgroup appears to have what might be termed generalized conceptual difficulties. Their language comprehension skills are poor (as assessed on tasks and as verbal absurdities and paraphrasing figures of speech). Their auditory

> memory for connected language is worse than that for random word or number strings. They are good decoders, but have poor reading comprehension. Their social perception skills are poor. In contrast, the second subgroup appears to have relatively intact conceptual skills but poor organizational or attentional skills. (Stone, 1980, p. 92)

Learning disabled adolescents who used spontaneous stratagies, on the other hand, exhibited still different characteristics. Of them, Stone (1980) says:

> their comprehension of language is good but they have problems in auditory analyses, and their auditory memory for connected language is better than for word lists. Their reading comprehension is generally good on untimed assessments, but their decoding skills are weak and their rate is slow. (p.92)

Stone (1980) stresses that the syndromes he delineates should not be considered definitive. They provide, however, sufficient detail to be excellent comparative models for further research. In attempting to delineate subgroups of strategy ~~users,~~ many factors must be considered. In employing strategy, one is essentially regulating behaviour and much can be learned from the changing role of language in that regulation (Vygotsky, 1962; Luria, 1982). Of equal value are examinations of the function of the frontal lobes in the organization of conscious behaviour.

FRONTAL LOBES AND ORGANIZED BEHAVIOUR

Luria (1963) discusses Vygotsky's theory of interpsychic and intrapsychic forms of behaviour. In interpsychic forms of activity, the preschool child's behaviour is regulated by his mother's gestures, naming of objects, and directives. Later, the child becomes internally regulated and "wills" his own action, (Luria, 1963). Luria (1961) sees the developmental aspects of the verbal regulation of behaviour as progressing through four stages; first, the regulatory role being external--that of the adult; second, the child's speech itself begins to take on the function of regulation; third, as language develops, what is said is more important than the fact that an utterance is made, and finally, internal speech takes over from external. Gardner (1976) and Luria (1963) point out that the development of "willed" or intrapsychic behaviour coincides with the maturation of the frontal lobes. The frontal lobes are the last to myelinate (Luria, 1980), beginning "to operate and to carry out complex forms of internal regulation of activity" (Luria, 1963, p. 253) several years after birth.

There is some discrepancy in the literature as to the age period in which this behaviour emerges. Luria (1963) has earlier given a range of 4 to 7 years, while in his later work he stated that "forms of action that are organized with the help of one's external and or inner speech . . . . becomes established in a child at 3 to 4 years of age" (Luria, 1982, p. 112). Since the cells which make up a large portion of the frontal lobes have been reported by some as not maturing until the late teens or early twenties, it is interesting to speculate as to the role of the frontal lobe in maturing behaviour.

In the frontal lobe patient then, we have an individual whose ability to carry out voluntary programmed actions is disturbed not because of the motoric dysfunction but because of the fact that speech has lost its directive function in the regulation of action (Luria, 1980). In the case of patients with massive frontal lobe damage, inner speech, the patient's own oral speech, or the directive language of another may both prove to be ineffective in the control of voluntary actions (Luria, 1973a, 1973b, 1980, 1982)

Those who approach the study of learning disabilities from a neuropsychological perspective have long supported their position by drawing similarities between the skill deficits and task performances of individuals with acquired brain damage and those having no discernible history of trauma. Developmental aphasias, dyslexias, dyscalculias and dysgraphias have their counterparts in the study of neurological deficits following documented brain trauma.

The parallels in the descriptions of the role of the frontal lobes in behaviour and in discussions of delineated inefficient learning strategies are striking. According to Luria (1980), the job of the third functional unit, and more specifically, the prefrontal cortex is the organization of conscious activity.

Frontal lobe patients may lack initiative, be unable to plan, sustain goal-directed behaviour, or perceive their own errors (Lezak, 1976). Penfield and Evans (1940), as cited by Penfield (1975), published data to support the position that "major removal of the anterior portion of the frontal lobe results in a defect in the patient's 'capacity for planned initiative'" (p. 19). Pribram and Tubbs (1969) state that "evidence suggests that the frontal lobe of primates is critically involved in the proper programming--the parsing of the stream of stimuli to which the organism is subjected" (p. 502).

The writings of A. R. Luria on frontal lobe dysfunction have included discussions on the regulation of mental activity (Luria, 1963, 1973a, 1973b, 1980), the regulation of states of activity (Luria, 1973a, 1973b, 1980), the regulation of movements and actions (Luria 1973a, 1973b, 1980, 1982), and the regulation of mnestic and intellectual actions (Luria 1973a, 1973b, 1980), as well as the extensive descriptors of behavioural disturbances previously discussed.

Each of these topics is part of a cohesive and detailed study. Rather than try to deal with each of the outlined areas in a sketchy and grossly superficial manner, emphasis will be placed upon the consideration of goal-directed behaviour, and verbal regulation of volitional action, the areas most relevant to the current work.

This limitation of the parameters of the present study is not indicative of a value judgment on behalf of the writer, but rather reflects a current research interest. The interrelatedness of various aspects of frontal lobe dysfunction, as evidenced in the delineated syndromes discussed in the literature, is recognized. Each individual patient's behaviour will be reflective of the consideration that different parts of the frontal lobes subserve different functions and that the severity of the disorder being discussed may vary depending on the nature and extent of the lesion (Luria, 1980). Yet there are specific behaviours which are of interest here.

GOAL DIRECTED BEHAVIOUR AND THE VERBAL REGULATION OF BEHAVIOUR

One of the principal manifestations of frontal lobe lesion is the disturbance of goal-directed behaviour. Luria (1980) describes the parameters of such behaviour:

> A disturbance of voluntary movement and actions arises only when the action has to begin in accordance with a preformed plan, and in particular, when there is ambiguity in its character, and its performance requires inhibition of other actions which are irrelevant and inappropriate to the task. (p. 294)

Luria (1963, 1973a, 1973b, 1980) describes in his patients the replacement of voluntary acts with stereotypic, perhaps habitual, previous behaviours. Luria (1980) states:

> the ease with which the necessary actions are replaced by irrelevant stereotyped acts, unconnected with the underlying task and depriving the activity of its selective character, constitute the characteristic features of the patients in the early stages of the development of the "frontal syndrome." (p. 295)

Luria (1973b) cites as an example a patient who, when asked to light a candle, did so by treating the candle as though it were a cigarette, holding it in his mouth and smoking it. In this case, the individual, according to Luria's (1973b) explanation, no longer remembered the action that the verbal command should have engendered and therefore replaced it with a more firmly established habitual response.

"Pathological inertia of previous stereotypes" (Luria, 1980, p.

304) may also be seen in the patient's drawings. Both speech and motor stereotypes used may become perseverative in nature (Luria, 1973a).

Indeed, the verbal commands of others or the verbal mediation of a frontal lobe patient may do little to alter an action. When complex voluntary movements requiring sequenced planning are demanded, and they are beyond the patient with massive frontal lobe damage, he may echolalically repeat an appropriate verbal directive but not be able to carry out the command it dictates (Luria, 1973b). "The patient does not establish the necessary connection between the stimulus and the accompanying verbal instruction, and he does not form a stable conditioned motor reflex" (Luria, 1980, p. 311). Spoken instruction then "lost its regulatory significance" (Luria, 1980, p. 315).

Also of interest is the fact that the patient makes no attempt to correct mistakes he is making in completing a task or action. He is apparently unaware of the mistakes (Luria, 1980).

Pribram (1971) cites an example of one of Teuber's (1964) patients who regularly visited the laboratory on Thursdays:

> One Thanksgiving afternoon he set out for the usual visit, saying to himself every step of the way, "Today is Thanksgiving, I should not go to the laboratory, no one is there." The special context of Thanksgiving day, though verbalized, had no effect on his behaviour. Only when he reached the laboratory and found no one there did he return home -- no wiser than he had been at the outset of his journey. (p. 345)

It is frequently impossible for patients with massive lesions of the frontal lobe to perform movements which conflict with those of an experimenter (Luria, 1973a). They also find it difficult to perform in conditions which require constant switchovers from one program to another (Luria, 1973a).

It appears that the execution of verbally programmed behavioural processes is disturbed by "massive (bilateral) lesions of the frontal lobes; symptoms of this disturbance may be observed also in patients with less pronounced (mostly left-side) lesions of the frontal lobes" (Luria, 1973a, p. 14).

Luria (1980) does point out that getting a patient with a relatively mild frontal lobe syndrome to repeat spoken instructions aloud may improve his performance. In discussing restorative training, Luria (1963) speaks of replacing "the internal correction of the action, disintegrating in the patient, by an external correction, introduced from elsewhere" (p. 249). When the patients display an inability to carry out complex actions with a purpose or to critically evaluate their own behaviour (Luria, 1980), Luria (1963) suggests a situation in which the ". . . instructor sits beside the patient and dictates to him every time he has to stop . . . (and correct an action), the patient subordinates his action to this external control and begins to do the work properly and obtain useful result" (p. 249). External control prevents the tendency to begin tasks impulsively and to continue them without monitoring the produced results.

It would appear, however, that, in patients with less extensive damage, the external speech of another person, perhaps accompanied by directive gesture, can, for specific tasks, lead a patient to successful completion of a task, replacing the patient's "own failing will by the will of another person and conversion of spontaneous behaviour into reactive afford the principal method of overcoming the defect associated with a lesion of the frontal lobes" (Luria, 1963, p. 252).

The restoration of functions involved in moving from an intention, to a plan, to inspection of performance, to regulation of action, to verification of activity and correction of mistakes (Luria, 1980) can be imposed by providing external verbal and written cues (Luria, 1963) and have educational implications. Educators Brown and Palincsar (1982) have recognized the similarities of the behaviours controlled by frontal lobe function and those described as metacognitive skills.

METACOGNITION

There is no one universally accepted definition of metacognition. Variance in the wording and in the scope of definitive explanations are common enough to cause some concern. Forrest-Pressley and Waller (1984) have said, "At best, it does not appear that the term metacognition has been used consistently by writers in the area, even at the conceptual level, not to mention operational" (p. 3). In reviewing the definitions and descriptions of metacognition, however, it is possible to find commonalities with explanations of the regulatory aspects of what Luria (1973b) terms the third functional unit.

Flavel (1976) has said:

> Metacognition refers to one's knowledge concerning one's own cognitive process and products or anything related to them e.g. the learning-relevant properties of information or data . . . . Metacognition refers, among other things, to active monitoring and consequent regulation and orchestration of these processes in relation to the cognitive objects or data on which they bear, usually in the service of some concrete goal or objective. (p. 232)

Forrest-Pressley and Waller (1984) say that "metacognitive processes refer to the control or executive processes that direct our cognitive processes and lead to the efficient use of cognitive strategies" (p. 2). Brown and Palincsar (1982) distinguish between two broad definitions of metcognition. The first is knowledge about cognition, and the second is the regulation of cognition. Knowledge about cognition "involves conscious access to one's own cognitive operations and reflection about those of others; it is a form of declarative knowledge about the domain "thinking"" (Brown & Palincsar, 1982, p. 1). According to Brown and Palincsar (1982), regulation of cognition involves:

> planning activities prior to understanding a problem (e.g. predicting outcomes, scheduling strategies, and using forms of vicarious trial and error), monitoring activities during learning (monitoring, testing, revising, and rescheduling one's strategies for learning), and checking outcomes (evaluating the outcome of one strategic action in terms of criteria of efficiency and effectiveness). (p. 12)

Brown and DeLoache (1978) define metacognition as the voluntary control an individual has over his own cognitive processes. They include in their outlining of the basic skills of metacognition self-questioning such as: "Did it work?"; "How am I doing?"; and "Does this make sense?" (p. 14-15). For students who do not use such skills spontaneously, Brown (1977) advocates direct intervention.

In reviewing the types of training strategies which can be utilized with inefficient learners, Brown and Palincsar (1982) reiterate their position on optimum training procedures: "an ideal training package would consist of both practice in the use of task-appropriate strategies, instruction concerning the significance of those activities, and instruction concerning the monitoring and control of strategy use" (p. 7). Brown and Palincsar (1982) emphasize that choice of general or specific strategies for training procedures depends on the needs of each individual student and the experiences he or she has had in applying strategies. Yet, as both specific and general self-regulatory skills are necessary in efficient strategy use, a good training program will include both. Obviously, self-regulatory skills transfer from task to task more readily than do specific routines, but they also ~~tend~~ to be weaker. As an alternative procedure, Brown and Palincsar (1982) cite Campione and Armbruster (in press) as suggesting intermediate skill training which is "more general than the extremely specific routines investigated in much of the literature, but more powerful than the weak, self-regulatory skills that have attracted so much recent interest" (p. 9). Brown and Palincsar (1982) refer to the self-instruction work of Meichenbaum (1977) as representative of such intermediate-level skill training.

One of the areas in which Brown et al. (1981) believe students can be trained to become more effective learners is in their ability to learn more efficiently from textbooks which they are required to read. To achieve this goal, Brown et al. (1981) advocate that students be taught active involvement in the choice of study techniques of self-monitoring strategies. Such involvement would include awareness of:

> (1) basic strategies for reading and remembering, (2) simple rules of text construction, (3) differing demands of a variety of texts to which their information may be put, and, (4) the importance of activating any background knowledge which they may have. (Brown et al., p. 20)

The essence of the Brown et al. (1981) theme is that students receive a level of instruction termed "self-control training" (p. 15). In this training, children are not only informed about the use of a strategy but are also explicitly instructed in how to employ, monitor, check and evaluate that strategy (Brown et al., 1981, p. 15). When eleven-year-old mildly retarded children were taught the self-control strategy in a rote recall task, their recall was enhanced, they were able to maintain the strategy over a series of post tests and could transfer their learning to a more school-like situation (Brown et al., 1979). It should be emphasized that eight-year-old mildly retarded children showed quite a different pattern, not utilizing or retaining the strategy in the same manner as the older students (Brown et al., 1981). Once again, the variant performance of children of differing ages in employment of a strategy has been evidenced.

The ability to train students to generalize strategies (Brown et al., 1981) and to retain training for periods of up to six months (Brown and Palincsar, 1982) is most encouraging. Yet perhaps it is not necessary to train every student who does not apply a strategy on his own volition.

STRATEGIES: SPONTANEOUS, ABSENT OR DORMANT

In reviewing the literature, Brown and Palincsar (1982) refer to a lack of spontaneity and flexibility in the preplanning, monitoring and various types of attentional strategies used among learning disabled children. In her work, however, Brown (1977, 1980, 1982) tends to take the student from lack of strategy use to strategy training. Day and Stone (1982) however, see another "state" between spontaneous use and absence in which the control-of-variables strategy is just "under the surface" and can be elicited through a demonstration of strategy use. For younger, sixth grade students, questioning (which forced them to choose between the "better" of two pairs of testing a particular variable) and a further requirement to make a verbal explanation (of why the pair was better) played a key role in elicitation. For older children, second opportunities to attempt a control-of-variables task in themselves resulted in improved strategy use (Day and Stone, 1982).

Stone's (1980) and Stone and Day's (1978, 1980) "elicited" strategy group seem somewhat analogous to the group which Flavell (1970) referred to as production deficient. "A production deficiency is said to exist when the child does not spontaneously produce a task suitable mneumonic but if trained to do so can use the mneumonic to improve performance" (Brown and DeLoache, 1978, p. 5). Flavell (1970) saw these difficulties in production as more than a "you have it or you don't" situation: "Mediator production is not an all or nothing affair, however, developmental intermediaries ("production inefficiencies") between nonproduction and efficient production are probably the rule rather than the exception" (p. 208).

It appears that a general pattern of performance exists between efficient and inefficient learners over a range of tasks. Seemingly in some students, latent skills can be elicited without specific training. Such patterns have also been noted by Meyer et al. (1980) in their work studying how ninth graders organize their recall after reading a passage. They have found that use of the text's top level structure in organizing recall is highly correlated with, if not causative in, the recall of information. Top level organization includes: problem/solution, comparison, antecedent/consequent, description and collection elements. When asked to write recall protocols, students rated as good comprehenders tended to use the same top-level structure as the author of the prose they were reading. However, most students with low comprehension skills did not utilize this structure. As well, students who utilized the author's organizational structure were better at discriminating between information consistent with the passage meaning and information based on the same topic but not from the paragraph in question. Meyer et al. (1980) anticipated and found three groups which appear to correspond to the spontaneous, elicited and strategy absent groups of Stone (1980):

> In contrast to good readers, poor readers were expected to approach text without knowledge of the text's organization and no effective strategy for utilizing the top-level structure of a passage . . . . In addition, a group of readers (labelled comprehension underachievers) were identified who could plausibly fall into Flavell's (1977) production deficiency category; that is, readers who could use the top level in test, but not without explicit prodding. (p.77)

Research into reading skills has yielded important information on how children impose and are affected by the imposition of structure in their reading activities. Hoskins (1986) advocates that we teach children text patterns or organizational patterns (i.e., cause-effect) but that we also teach the superstructures, the understanding of which allows the reader to control the text.

EXTERNAL ORGANIZERS IN READING ACTIVITIES

The sensitivity of good reading comprehenders to the top-level structures used by authors has been discussed (Meyer, et al., 1980). Other studies have also examined the relationships between the text and the reader. Frase (1969) found that high school graduates had improved and more organized recall when reading paragraphs about chessmen organized by concepts over those organized by attributes or by randomization. Oakan et al. (1971) state that "some difficulties in reading comprehension can be accounted for in terms of a mismatch between the reader's typical patterns of linguistic organization and the organizational patterns required for the comprehension of the particular written material" (p. 72). Cromer (1968), as cited by Oakan et al. (1971), divided poor comprehenders into two groups: those with vocabulary skill deficits and those with organizational problems. It was found that children experiencing the latter difficulty read word by word rather than in meaning units. Researchers have also resorted to actual manipulation of the sentence structure to study the factors affecting comprehension. By organizing selections into meaningful phrases separated by spaces, Oakan et al. (1971) found that the comprehension of poor readers who did not have vocabulary problems increased significantly. They concluded that "if poor readers typically do not organize their input into efficacious patterns, they may have considerable difficulty understanding what they have read" (Oakan, et al., 1971, p. 77). Imposing an organization on the material resulted in comprehension improvement only with the inefficient readers. Good readers spontaneously organized words into units of meaning.

Textbook organization can contribute to less difficulty for students in specific content areas. Armbruster and Gudbrandson (1986) believe that with the implementation of "simple rules such as 'Headings signal more important or general information than subheadings,' the need for teaching reading skills would be significantly reduced." (p. 47).

Effective use of the more structural aspects of textbook organization has long been recognized as the mark of a good reader. Being able to use a textbook as an information source is a skill essential to academic success. "Beginning in the intermediate grades and continuing through high school and college, a large part of a student's school time is spent reading textbooks to acquire information" (Adams, Carnine and Gersten, 1982).

A difficult task for many learning disabled adolescents and adults is "tackling" a textbook in order to do independent study or reading. "Secondary school students often approach content textbooks passively and negatively, with little understanding of what to learn or how to learn it" (Davey, 1986). These students seem in many cases to lack any kind of systematic approach to the eliciting of the information from the printed page in ways which will add to their knowledge of the subject matter and assist in their remembering facts to integrate into their general knowledge for examination purposes. While one might argue that such strategy deficiencies should be expected from individuals who have, in many cases, spent the years in which their classmates were developing such skills struggling with the more elementary tasks of decoding, that argument may in some cases lead to the dismissal of evidence of organizational or strategy deficits and subsequent attempts to ameliorate them. "A crucial issue in content areas reading is how to instruct students so that they are able to study and learn from their texts" (Moore and Readence, 1983). Toward that end, instruction in effective study techniques seeks to increase student awareness of how textbooks are organized and how they can generate study questions relevant to the content. Approaches such as the SQ3R Technique (Robinson, 1941) and the PQRST Study Plan (Spache and Berg, 1966) are examples of such methodology. Other approaches include the interactive Request procedure (Manzo, 1979); the textbook activity guide (TAG) approach (Davey, 1986); and a writing strategy to be used in studying and learning in the content areas: PORPE (Simpson, 1986).

While in the literature there is acknowledgment of study skill deficiency (Adams et al. 1982); devotion of time to students' effectiveness in comprehension (Bos, 1982) and of recall (Meyer et al. 1980); and description of procedures which train students to extract information from texts (Brown et al. 1981), little detailed observational documentation has been produced regarding the basic task approach of inefficient students when they approach texts. From Durkin's (1978) work it would appear that in some elementary school settings little instructional time is devoted to study instruction. It would seem that documentation of explicit deficiencies in independent study skills might be a good first step before implementation of instruction. Here, of course, the issue of readability is of great importance. Kibby (1979) has cautioned:

> If teachers do not recognize that a child must automatically process some proportion of the words in a passage before experience and language skills can be applied, then a gross misinterpretation of the child's reading strengths and strategies may result. (p. 391)

Kibby (1979) is convinced that a great proportion of errors labelled as failure to use syntactic and contextual clues are merely problems of automatic word identification. Caution regarding interpreting reading problems as study skill problems is equally appropriate.

It would seem that individuals who experience problems in planning and regulating their behaviour in problem solving and basic school activities might also experience difficulties in organizing themselves effectively at home or on the job. If organizational problems are pervasive, it was felt that the present study might expand beyond the school room to tap some skills required in day to day existence.

DAILY LIVING

Indeed, organizational problems and strategy deficits can interfere with the routine of life's activities ouside of the task demands of the school (Blalock, 1981). Hayes-Roth and Hayes-Roth (1979), Hayes-Roth (1980), and Goldin and Hayes-Roth (1980) have investigated individual differences in the planning abilities of adults by utilizing a thinking aloud protocol produced when an individual plans a hypothetical day's errands. They define planning as

> the predetermination of a course of action aimed at achieving some goal. It is the first stage of a two-stage problem-solving process. The second stage entails monitoring and guiding the execution of the plan to a successful conclusion. We refer to these two stages as planning and control. (Hayes-Roth and Hayes-Roth, 1979, p. 276)

Hayes-Roth and Hayes-Roth (1979) base their work on an opportunistic model which draws on cognitive psychology and artifical intelligence. It is proposed as a "useful framework for future investigations of the planning process" (p. 308). The model consists of independent cognitive specialists which generate decisions during the planning process. These specialists record their decisions on a blackboard which contains five conceptual planes: plan, plan-abstractions, knowledge-base, executive and meta-plan. Each plane is in turn made up of a number of levels.

Subjects are given a map and a brief description of their whereabouts, the time, some fixed time commitments later in the day, and a list of errands. There are purposefully more errands included in the list than it would be possible to complete in the time frame. "The subject's task was to formulate a realistic plan indicating which errands he would do, when he would do them and how he would travel among them" (Hayes-Roth and Hayes-Roth, 1979, p. 277).

Using the opportunistic model, Goldin and Hayes-Roth (1980) found that there was a clear pattern of individual differences between good and poor planners and that those differences consisted mainly of the degree to which the planners consciously monitored and controlled their planning. Among the differences between good and poor planners were the following:

- good planners showed more structured and flexible planning. "Good planners control their planning behavior with consciously generated metacognitive strategies and criteria while remaining open and responsive to a variety of data" (p. 37)
- good planners were better at maintaining their focus of attention.
- good planners reviewed and evaluated their previous decisions more frequently.
- good planners tended to be more conscious of time constraints and of spatial clusters of errands.
- good planners had larger repertoires of planning and knowledge, and used their knowledge

more effectively.

In this series of studies there is an abundance of comparative descriptive data which make the qualitative differences of the subjects more evident than in much of the research which investigates strategy.

SUMMARY

In summary, as evidenced from the preceding selected review of the literature, there is a considerable lack of precise information on the task approach and strategy use of clearly-defined samples of adolescents who are not learning efficiently. Existing in the literature are attempts to outline organizational difficulties of learning disabled high school students as they attempt to study and complete assignments (Alley and Deshler, 1979). As well, a study has examined the problem-solving techniques of learning disabled teenagers on school-related tasks using more specific performance criteria (Havertape and Kass, 1978). Research in which deployment of a single defined strategy is related to underlying processing abilities is rare but may be found in the work of Stone (1980). Developmental factors in the ability to regulate behaviour have been recognized (Lunzer, 1968) as has the role of the frontal lobes in the organization of conscious activity (Luria, 1980). Brown and Palincsar (1982) have acknowledged similarities between poor problem solvers and patients with frontal lobe syndrome.

Of interest in the proposed study were those individuals who do not seem to grasp just how to go about school tasks, regardless of numerous exposures. By some definitions, these might be considered to be strategy-absent individuals. However, it appeared from the literature that, among those who have difficulty employing strategies, there would be those from whom strategies might be elicited (Stone and Day, 1978). The existence of this "third group," who appear to destroy the theory of strategy being either present or absent, has been noted by Flavell (1970) in his study of memory and by Meyer et al. (1980) in their study of reading comprehension, as well as by Stone (1980) in his work on Piagetian tasks.

The present study presented subjects with tasks which allowed the researcher to determine strategy presence or absence. In turn, attempts to elicit strategy gave an opportunity to see if three groups would form. The three projected groups were thought to be composed of those who would use strategy spontaneously, those who would employ strategy after elicitation, and those who would not use a described strategy either before or after attempts to elicit a particular behaviour.

Further, through qualitative description of subjects as they completed a variety of tasks and by conducting in-depth interviews, an attempt was made to determine the nature of the organizational skills and strategy use of learning disabled adolescents and the extent to which those behaviours were specific or transsituational.

CHAPTER III

RATIONALE AND DEFINITIONS

RATIONALE

The literature appears to reveal a definite difference between good and poor students in their ability to organize themselves as they complete tasks (de Hirsch and Jansky, 1980; Blalock, 1981) as well as in their ability to profit from the inherent organization that exists within the materials with which they work (Oakan, Wiener and Cromer, 1971; Meyer et al. 1980). Some of these poor students, despite repetitively experiencing the same situations and opportunities that are afforded to their classmates, remain novices in solving problems in which they might be expected to be experienced performers. It seems apparent that inefficient learners can be trained to become more efficient (Alley and Deshler, 1979; Brown et al. 1981; Wong, 1982) but that they may generalize their learning from task to task only with further specific training (Brown and Palincsar, 1982). Furthermore, it would appear that qualitative differences in task performance remain between those who use a strategy spontaneously and those in whom the strategy is trained (Brown and DeLoache, 1978) or elicited (Day and Stone 1982).

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Of interest here was a detailed examination of the task approaches of inefficient learners. Of equal concern was the question of how the strategies of inefficient learners with organizational problems varied from task to task and from individual to individual.

Two rather extensive bodies of literature exist in the research which investigates strategy use by the learning disabled. One of these probes is comprised of studies which show consistent evidence that learning disabled children do not spontaneously supply strategies to many tasks (Torgeson, 1979, 1980, 1982a; Wong, 1979, 1980; Loper and Murphy, 1985). In examining the lack of strategy use in the inefficient learner, Torgeson (1982a) found that in 40 studies published between 1977 and 1982, which discussed learning disabled children's use of information processing strategies, there was convincing evidence that "learning disabled children as a group do not engage readily in certain organized, goal-directed strategies that aid performance on intellectual tasks" (p.46). The second major thrust in language disability strategy-use investigates efficient methods of training children and adolescents, who do not use strategy, to begin to employ strategies efficiently and/or generally (Towle, 1982; Gordon and Graun, 1985; Meichenbaum, 1985; Reder, 1985; Deshler and Schumaker, 1986; Weinstein and Mayer, 1986). In pursuing the effectiveness of strategy training Wittrock (1986) has stated:

> The teaching of learning strategies and metacognitive strategies has been found also to be effective in educational settings to facilitate attention, motivation, learning memory, and comprehension, as well as remediate some learning disabilities. (p.310)

A point frequently overlooked in both the areas of investigation just outlined is the impact of one of the essential qualities of the term learning disabilities--namely, that the wide and variant characteristics embodied by the descriptor mean that what may be true of the group in general is not necessarily true of individuals or subgroups within that larger group. If researchers and practitioners take the stance that because a) the learning disabled do not use strategies spontaneously and that because b) strategy-training is beneficial to the learning disabled, that, therefore c) all learning disabled should be given strategy training, the problem may have been viewed too simplistically. Researchers have an obligation to probe more deeply into the issue. Torgeson (1982a) states clearly that not all the learning disabled have strategy deficiencies and therefore it must follow that all do not need strategy training.

Interestingly, although there is strong evidence that some learning disabled students are not efficient strategy users and despite the rush to train poor students to use more rewarding approaches to their work, little documentation exists regarding just what inefficient learners do which is so unrewarding. Torgeson (1982a) has said that "Unfortunately we have a much better description of what learning disabled children do not do than what they do" (p.48). An examination of the literature appears to indicate that Torgeson's concern is shared by very few researchers. Although this point was, in all probability, the stimulus behind the Havertape and Kass (1978) study from which behavioural descriptors of task approach resulted.

The writer, in reviewing the literature, became increasingly concerned about the mushrooming numbers of studies which advocate specific and general strategy training with little or no concern about what the learner is or is not bringing to the task at hand. It is just this lack of information which the present study chose to address through qualitative, descriptive methods. These methods in turn, allowed a close examination of task performance as well as metacognitive awareness and regulation of task performance.

Although, as stated previously, the Havertape and Kass (1978) study initiated such a probe, it was believed that more precise qualitative information could be gathered using a more specifically defined sample. Stone (1980) has recognized the importance of acknowledging the hetrogeneity of the learning disabled population and the resultant obligation to relate behaviours to subgroup characteristics. Stone and Michals (1986) have stated "...we need to consider the nature of the learning disability even when examining an area of performance as general as problem solving..." (p.307). In order to properly address the issue of hetrogeneity in studying the learning disabled there are at least two broad approaches which might be considered. The first approach would be to study a very large group as they complete carefully defined tasks and to determine subgroup differences on the basis of the relationships between characteristics brought to the task, and the relative efficiency of the subjects' task performances. Such an approach has been utilized with increasing popularity in the study of dyslexia (Mattis, 1981; Satz and Morris, 1981; Hynd and Cohen, 1983).

A second type of broad approach to dealing with a group with divergent characteristics is to limit those studied to a rationally defined subgroup (Torgeson, 1982b) in which the sample is limited beyond the parameters of the accepted wider definition of the group as a whole. As previously discussed, while it has been acknowledged that, as a group, the learning disabled do not spontaneously employ goal-directed strategies (Torgeson, 1982a; Loper and Murphy, 1985), it must also be recognized that studies which point out spontaneous strategy-use in some learning disabled individuals do exist (Stone, 1980; Torgeson, 1982a). To obtain a rationally defined subgroup with strategy deficiencies, it would be important to focus on those subjects who would be most likely to exhibit problems in organized task approach.

Since it was the intent of the present study to document some of the characteristics of inefficient task approach, use of in-depth qualitative research on a small carefully defined subgroup seemed the most promising approach. Teacher description of students based on specified organizational criteria and teacher nomination assisted in the refinement of the sample.

In the present study, an attempt was made to descriptively document the task approaches of the disorganized, inefficient learner by utilizing and analyzing not only an ongoing verbal description by the subject as he completed tasks but by incorporating manipulative task elements which could be directly observed and analyzed. Set descriptors were utilized as frameworks on which to trace individual behaviour patterns. These descriptors were also used as the basis of questioning for metacognitive and third-party behavioural judgement. It was important as well, however, that the researcher leave herself open to observations which were unhampered by preconceived notions. Fareed (1972) warns about forming protocol data into previously determined classifactory schemes. The specificity of classification schemes must be carefully considered. Olshavsky (1976-77) found that using broad descriptors tended to eliminate differences between groups. Any classification descriptors can be quantified if such data is required for statistical comparisons (Havertape and Kass, 1978; Goldin and Hayes-Roth, 1980). However, it is important that classifications are more descriptive than nominal. Relabelling and sublabelling those who are already labelled--perhaps mislabelled--would be a meaningless activity.

Of some use in developing meaningful classifications of behaviour was the literature describing those who have difficulty regulating and monitoring their activities because of brain lesions (Luria, 1973a, 1973b, 1980; Milner, 1964, 1983; Petrides and Milner, 1982). As well, those studies which look closely at the underlying processing skills which may contribute to a certain strategic approach were of value (Stone, 1980; Stone and Day, 1978; Day and Stone, 1982).

OPERATIONAL DEFINITIONS

The organization of conscious activity: Given an intention, the strategy may include: the formation of plans and programmes of action; the inspection of the performance of an action; the regulation of behaviour so that it conforms to the established plans and programmes; the verification of the action by comparing the effects of the activities with the original intentions; and the correction of mistakes. (After Luria, 1980).

*Planning: to create or to appear to create a method of procedure. May be done overtly or be implied by such behaviour as a thoughtful pause between hearing a goal and beginning to move toward that goal.

*Inspection: a careful or critical examination of task performance.

*Regulation: to adapt behaviour to conform to a plan--ongoing.

*Verification: a comparison of the effects of the activities with the original intentions.

*Correction: to redo, after comparing the effects of the activities with the original intentions.

Strategy: a sequence of steps followed in the organization of behaviour.

Spontaneous strategy: the implementation of a specified strategy (defined qualitatively or quantitatively) on the first trial of a given task.

Elicited strategy: the implementation of a specified strategy (defined qualitatively or quantitatively) after failing to use the said strategy on a first trial of a given task but using the strategy on a second trial subsequent to having watched, compared and judged the better or best of a series of demonstrated strategies of varying effectiveness.

*This characteristic may be manifested verbally or nonverbally by a variety of behaviour which shall be labelled at the discretion of the researcher.

Strategy absence: not implementing a specific strategy (defined qualitatively or quantitatively) on the first trial of a given task or on trials subsequent to evaluating demonstrations of the strategy.

Control-of-variables strategy: the employment of an unconfounded test of four of the six variables present in the Rods Task; namely: material, length, diameter, base, amount of weight, and position of weight. The subject must name the variable as well as perform the test of that variable.

Demonstrated strategy type 1: least efficient demonstration.

Demonstrated strategy type 2: moderately efficient demonstration.

Demonstrated strategy type 3: most efficient demonstration.

Observed strategy: a sequence of steps followed by an individual subject in completing a task.

Specific strategy: a sequence of steps followed by an individual subject in completing a task and peculiar or limited to the completion of that single task or type of task.

Transsituational strategy: a sequence of steps followed by an individual subject in completing a task, which may be followed in or generalized to a number of tasks or problems.

Disorganized student: one who is identified by teacher nomination and by a rating score of 45 or below on the Questionnaire On Organizational Skills. Both these criteria must be met by 1 of 2 teachers polled.

Organized student: one who is identified as organized by teacher nomination and by a rating score of 56 or above on the

Questionnaire On Organizational Skills. Both these criteria must be met by 1 of 2 teachers polled.

DELIMITATIONS

The present study varied in focus from much of the research dealing with metacognitive skills in school-aged children. First, the focus was on adolescents, not younger children. Second, the tasks chosen were neither memory tasks nor common academic endeavors such as reading. Thirdly, no attempt was made to teach strategies or to use intervention techniques. The frequency of studies on younger children, in memory or school subject-related tasks, in which self-regulatory training is employed has been fairly extensive (Loper and Murphy, 1985). As stated previously, a major purpose of the study was to determine the nature of inefficient strategy use by LD adolescents through observation and protocol analysis techniques.

LIMITATIONS

1. The inclusion within the present study of four detailed tasks, thirty questions regarding study skills and organizational habits, as well as a battery of ability and achievement tests, gives the researcher and the reader a vast number of facts to weigh and interrelate. While all the facts gathered were of value and the process of seeking out patterns was a fruitful endeavour, the study itself becomes complex. Tabular formats have been used extensively to help to clarify the text and the data analysis procedures.

2. The Questionnaire on Organizational Skills purports to measure six aspects of organizing conscious activity: general organization, planning, inspection, regulation and correction. The three or four questions comprising each of the six areas were devised by the author as being reflective of that skill. No field work outside of the pilot study, which was later incorporated into the present study, was do[illegible]. The reliability and validity of the instrument is unknown.

CHAPTER FOUR

METHODOLOGY

THE STUDY GROUP

An arbitrary number of five was chosen as a reasonably sized group on which to test the workability of the tasks devised for the present exploratory study. The subjects were chosen in the manner outlined under screening procedures.

The first step in choosing subjects for the exploratory study was to limit the population from which the sample was to be drawn to students who were receiving or who had recently received assistance in the Learning Assistance room at M. E. LaZerte High School in the City of Edmonton. This eliminated the need to manually search all student files and presented a high probability of yielding an appropriate sample.

Two additional students from Holy Cross and E. D. Feehan Collegiates in Saskatoon, Saskatchewan, were added to the five Edmonton subjects when the researcher relocated following initial data analysis. These seven students formed the present study sample. The Saskatoon subjects were selected through the cooperation of the resource teacher at the aforementioned schools.

The two Saskatoon subjects were chosen according to the same criteria as the initial five, but the parameters were refocused in order to expand the opportunities to observe students with characteristics either present in only one Edmonton subject or not represented in the five previously selected subjects. For example, while four of the five Edmonton subjects exhibited problems in reading or in reading and math, only one subject had good reading skills but severe deficits in math achievement. An attempt was made to locate another student whose general academic profile would be similar to that of the strong reader/poor math skills subject.

The second variant criteria was based on the need to include a child with cultural difference in the study. Since the study was exploratory in nature, the researcher felt a representative case of a native student who met all screening requirements but that of socioeconomic status would be valuable. While one of the students in the Edmonton group was not Canadian and was of a different racial background, he had been born in England and had lived only in English speaking countries. He also came from a family of a socioeconomic status well within the criterion established for the present study.

The student chosen because of cultural difference was a young man of Metis descent whose socioeconomic status was very low. He met all other criteria designated by the study.

Selection of a student who read well but had severe difficulty in Math proved to be surprisingly difficult. The writer expanded her search beyond those students receiving resource help to those who were in the general math programs in the two Saskatoon schools. Hundreds of files were examined before a likely candidate emerged. The "good reader but poor in Math" image of that candidate prevailed through the screening but, in individual testing, the subject's reading skills as measured by the Woodcock Reading Mastery Tests were too low for him to be considered a good reader. He was included in the study as his profile, except for not being seen in the resource room, was similar to the other subjects and he met all the screening criteria of the present study.

INITIAL SCREENING

Subjects were chosen according to the following criteria:

Freedom from general exclusionary conditions. Evidence of physical, sensory or emotional handicap which might have been the primary reason for academic difficulty was examined. Investigations into written records led the researcher to believe that the pilot group was free from any such problems. However, parental interviews following the data analysis revealed that there was some concern regarding possible central nervous system damage in one student. The difficulty, apparent at birth, was not mentioned in the school records.

Relatively high socioeconomic status. It was believed, if subjects were selected from families falling into ratings in the first three classes on the Blischen scale, that the likelihood of choosing a student whose underachievement was due to limited environmental experience would be greatly reduced. In cases where the student was part of a family setting where there was a single female parent, or where remarriage of the mother had occurred and records on the new father's work were incomplete, the mother's occupation rather than the father's type of work was rated. The student chosen specifically because of cultural differences lived in poverty and, therefore, did not meet the high SES criteria.

Average to above average intellectual ability. Not all students had been given individual intelligence tests in the past. In previous testing, group tests such as the *Lorge Thorndike* or the *Canadian Cognitive Abilities Tests* had been the only measure used with some students. Other subjects had been tested with the *Weschler Intelligence Scale for Children - Revised* *(WISC-R)* but the results varied from having been obtained within the year to being as much as eight years old in some cases. Students whose Verbal or Performance IQs fell in the average (90 to 109) to high average (110 to 119) ranges on the various instruments were selected.

History of difficulty in academic programs. Students' records were examined for information regarding low or failing grades, referrals for specialized testing, and teacher comments of concern about student progress. Care was taken to select students in whose files documented difficulty had been evidenced throughout their school careers rather than students who seemed to experience problems only after they had entered high school.

Present difficulty with academic programs. As the student population from which the sample was being drawn was one in which tutorial help was being or had been received, it was important to substantiate the continuance of academic problems. The students selected had all experienced some failure in the school term. The percentage of courses being failed ranged from 22 to 67 percent with students having averages ranging from 46% to 72% (see Table 1). The student having the greatest difficulty in school was the only subject

Table 1

School Performance of all Subjects

Subject	Age	Grade	Number of Subjects Taken	Number of Academic Subjects	Most Recent Average %	Lowest Mark (Subject) %	Highest Mark (Subject) %	Number & %age of Subjects Failed
A	16y 1m	10	8	5	49	15 (English and Social Studies)	70 (Art)	2 (25%)
B	16y 5m	11	7	4	56	33 (Psychology)	75 (Building Construction)	3 (44%)
C	17y 0m	11	9	7	46	32 (Accounting)	66 (Graphic Communications)	2 (22%)
D	15y 4m	10	7	4	55	39 (Materials)	68 (Math)	2 (29%)
E	19y 1m	11	4	1	67	35 (English)	93 (Facts of Life)	1 (25%)
Δ F	18y 10m	11	*4 [4]	3 [3]	72 [53]	65 (Biology)	77 (General Math)	0 (0%) [1 (25%)]
G	15y 11m	10	6	5	47	28 (Science)	70 (Physical Education)	4 (67%)

Abbreviations:
y = year
m = month(s)
% = percent
%age = percentage

*no mark assigned for resource room
Δsquare bracketed information is from the previous report period of the same semester

Note: Information on Subjects A-E was based on the April 1983 assessment.
Subject F was tested in March and May of 1984; Subject G in April of 1984.

who was taking all academic courses and the only student who was not receiving resource room help.

Specific difficulty in either reading or mathematics as indicated by standardized testing. Standardized testing in mathematics was not conducted beyond the sixth grade level in the Edmonton Public School System and was not done routinely in Saskatoon; therefore, the researcher turned to reading scores for standardized information.

Edmonton students who met the criteria as previously outlined and who obtained the six lowest scores of all the subjects screened on the Davis Reading Test were originally included in the pilot study. The Davis is a group test which is designed on a multiple choice format and which is given to all ninth graders in the Edmonton Public School System. Although the Davis yields percentile performance scores for both reading level and reading speed, the level scores were the ones considered in the selection of subjects. On this measure five of the six students had scores falling below the 15th percentile while the sixth had a reading level score at the 29th percentile. Although Davis results were helpful in distinguishing poor readers in this initial stage of the study, they were at best rough estimates of the students' abilities.

In the Saskatoon Catholic School System the standardized tests used routinely at the elementary level are the Canadian Tests of Basic Skills. No periodic standardized group testing was done at the high school level. However, both Saskatoon subjects had been seen routinely over the years for individual assessments. Very recent individualized standardized results in the form of Woodcock Reading

Mastery Tests (Woodcock) and Wide Range Achievement Test (WRAT) Arithmetic subtest scores were available for the culturally disadvantaged student. The student with Math difficulty had not received an individual assessment for four years and so he was given the WRAT Reading and Arithmetic subtests once it was clear that he had met all the other criteria. The resultant fifty-four point split in percentile scores between the two subtests in favour of Reading was the largest discrepancy which could be found through the extensive screening process for a second Math-disabled student. It did not, however, approximate the ninety-two point split in the other subject with good reading and poor math skills

FURTHER SCREENING

The subjects selected in the initial screening procedure were required to pass four additional screening steps: an interview, an assessment of organizational ability, individualized intelligence testing, and individualized achievement testing.

Interview. Individual interviews were held with each student, outlining the purposes of the study. It was explained that the tests and tasks involved were not directly involved with the students' programs and that they would be working as volunteers. All seven seemed eager to take part.

Assessment of Organizational Ability. The intent of the present study was to investigate the strategies used by students who might not only be called inefficient learners but who were identified as having organizational problems by their teachers. The identification procedure centered on the completion of a twenty-point questionnaire. Questionnaires were completed by two of each student's teachers. In three cases one of the teachers was the Learning Assistance or Resource Room teacher while in the remaining instances classroom teachers filled out both forms.

The questionnaire was made up of two parts. Part A covered general organizational ability and five aspects of organizing conscious activity: planning, inspection, regulation, verification and correction. Teachers were asked to read a statement and indicate if they saw the behaviour described in the statement always, usually, sometimes or never. They were also given the opportunity to check a "don't know" column if they were unsure of how the student would behave in a given situation. Teachers were cautioned to respond to the student's organizational ability rather than to his academic ability. They were also asked to respond in a reflection of ongoing student behaviour and not just to utilize the questionnaire as a checklist for a single observational period. Appendix B contains a sample of the questionnaire and the accompanying letter given to teachers.

Part B of the questionnaire gave the teachers the opportunity of stating whether, in their opinions, the student was organized or disorganized and to add written comments of their choosing. This section of the questionnaire also allowed the teacher to indicate the subject area in which the student was being instructed.

Questionnaires were analyzed in a number of ways including: teacher classification, global numerical rating, and ratings on six aspects of the organization of behaviour. In terms of teacher classification, three of the seven students received one organized and one disorganized rating; three students were rated as disorganized by both their teachers while another received two organized ratings. Numerical ratings on the questionnaire were obtained by awarding scores from 4 to 0 on the five ratings previously discussed. The range of global scores out of a possible 80 was 18 to 69. Scores in the fifty and sixty range were clearly rated as organized by the teachers while scores in the 30 range and below were always rated as disorganized. Ratings in the 40 range were rated as disorganized in all but one instance, that of Subject C's ratings (see Table 2). Since his numerical rating was in the

Table 2

Organizational Classifications and Numerical Ratings by Subjects' Teachers

	Academic Setting		Less Academic Setting	
Subject	Classification	Rating	Classification	Rating
A	Disorganized	18	*Disorganized	*34
B	Disorganized	34	Organized	69
C	Organized	40	Organized	69
D	Disorganized	34	Organized	*47
E	Disorganized	43	*Organized	52
F	Disorganized	40	*Disorganized	*40
G	Disorganized	41	n/a	n/a
	Disorganized	25		
$\bar{X}$		36.63		51.83

*Rating by learning Assistance Teacher

40's he was included in the study despite two verbal classifications of "organized".

Ratings on the six aspects of organizational behaviour as completed by two raters per student did not yield similar patterns. It must be stressed that all but one student was rated in each of both an academic setting and a nonacademic or tutorial setting. Student G took only academic subjects and received no tutorial help, therefore he was rated in two academic settings. Six of the eight academic settings were English classes while two were Mathematics courses. The remaining classes were Woodworking, Industrial Arts, Facts of Life and Learning Assistance. Invariably, students were rated more highly in the less academic setting. In Table 2, the first classification and rating columns represent the academic settings while the two last columns show the summary information from questionnaires filled out by teachers in less academic settings. Table 3 outlines the organizational steps which were rated most highly and those considered to be least effectively carried out.

Teachers who taught the subjects in more academic settings tended to classify them as disorganized rather than as organized (see Table 2) and also saw them as engaging less often in specifically described organizational behaviours. This less frequent behaviour was reflected in a lower global numeral rating (see Table 2). When responses to the randomized items were clustered into six categories: general organization, planning, inspection, regulation and correction, a pattern emerged in the responses of the "academic" teachers. Without exception, they rated students most highly on their general organizational ability (see Table 3). Three of the seven subjects were seen utilizing inspection less frequently than any other skill in academic settings (see Table 3). Teachers in less academically oriented programs tended to see the students as organized and as engaging more often in specifically described organizational behaviours (see Table 2). No general pattern emerged in the results of the behaviour most highly rated in the less academic settings; however, four of the seven students were rated most highly in general organization ability. Six of the seven students received their lowest ratings or one of their lowest ratings in their ability to verify (see Table 3).

Individual Intelligence Testing. Those students not having been tested with a WISC-R or a Weschler Adult Intelligence Scale - Revised (WAIS-R) in the twelve-month period preceding the present pilot study were given an individualized assessment with the most appropriate instrument. Four of the seven subjects required such testing. Letters were sent to the parents of all seven subjects requesting permission to test and informing them of the purposes of the study (see Appendix A). Results of the intellectual assessment substantiated the previously available information that all the subjects had a measured Verbal or Performance IQ in the average to above average range. Table 4 summarizes the findings of the intellectual measures.

Individual Standardized Testing in Reading and Arithmetic. In order to have more updated and specific information about the degree of disability in the students' reading and basic math skills, further

Table 3

Highest and Lowest Ratings on the Five Aspects of Organizing Conscious Behaviour and General Organizational Ability as Represented by Teacher Responses to a Questionnaire

Subject	Academic High Rating	Less Academic High Rating	Academic Low Rating	Less Academic Low Rating
A	General Org.	General Org.	Planning Inspection	Verification
B	General Org.	Inspection	Correction	General Org. Verification Correction
C	General Org.	General Org. Inspection	Inspection Correction	Verification
D	General Org.	Planning	Inspection	Correcton
E	General Org.	Correction	Regulation	Verification
F	General Org.	General Org.	Correction	Inspection
G	General Org. General Org.		Verification Verification	

Note: Both of Subject G's ratings occurred in academic settings.

Abbreviations: Org. = Organization

testing was conducted. The Arithmetic subtest (Level 11) of the WRAT and three subtests, Word Identification, Word Attack and Passage Comprehension of the Woodcock Reading Mastery Tests Form A, were administered. The WRAT manual reports split-half reliabilities for each subtest by grade level. All reliabilities exceed .90 (Salvia and Ysseldyke, 1978). Since the Arithmetic subtest measures only computational skills, it does not assess the content of the curriculum, bringing into question the content validity. However, the test can be usd to obtain a global picture of achievement (Salvia and Ysseldyke, 1978). Reliability of the *Woodcock Reading Mastery Tests* is questionable for some subtests, especially at older grade levels, while validity is acceptable (Bunch and Robertson, 1983). More specifically, the subtests used in the present study have been reported to have relatively high split-half reliabilities, all

Table 4

Verbal, Performance and Full Scale intelligence Quotients for the Seven Subjects

Subject	C.A.	Instrument	Verbal IQ	Performance IQ	Full Scale IQ
A	16-1	WAIS-R	98	87	92
B	16-5	WAIS-R	100	115	107
C	17	WAIS-R	98	107	102
D	15-4	WISC-R	112	105	109
E	19-1	WAIS-R	105	107	106
F	18-10	WAIS-R	86	97	89
G	15-11	WISC-R	109	109	110

Abbreviations C.A. = chronological age
IQ = Intelligence Quotient
WAIS-R = Weschler Adult Intelligence Scale - Revised
WISC-R = Weschler Intelligence Scale for Children - Revised

exceeding .93 (Salvia and Ysseldyke, 1978).

Percentile scores from the Woodcock passage comprehension subtest and the WRAT Arithmetic subtest may be found in Table 5. Those with scores falling below the 40th percentile on the Woodcock passage Comprehension subtest were considered to have a reading problem while those having a percentile score of 35 or below on the WRAT Arithmetic subtest were labelled as having difficulty in mathematics. These cut-off points were arrived at arbitrarily. One subject had scores lower than the cut-off point only in Arithmetic; two had problems in Reading Comprehension but not in Mathematics; and four others had difficulty in both subject areas.

Table 5

Percentile Scores on Individualized Achievement Tests

Subject	Woodcock Passage Comprehension	WRAT Arithmetic Subtest (untimed)
# A	55	23
+ B	28	81
+ C	37	47
o D	7	30
o E	1	7
o F	38	66
o G	38	21

Code: # = math problem

+ = reading problem

o = math and reading problem

SAMPLE

The study was made up of seven male adolescents who were experiencing academic difficulty and who were identified by at least one of their teachers as being disorganized. Academic difficulty was defined as presently failing at least one school subject in the present or just previous reporting period and having a history of achievement problems. Teacher nomination of disorganized behaviour was accompanied by the completion of a questionnaire by the same teacher so a substantiating numerical rating could be obtained. Six of the subjects were required to come from a family whose income could be classified as falling into the first three levels of the Blischen Scale. The final subject (Subject F) was purposely chosen because of cultural difference and lived in poverty.

The students had no recorded problems of a physical, sensory or emotional nature and were of average to above average intelligence The mean age of the group was 17 years 1 month (range 15 years 4 months to 19 years 1 month), with a mean Full Scale IQ of 103.8 (range 92 to 110), a mean Verbal IQ of 101.1 (range 86 to 112), and a mean Performance IQ of 103.8 (range 87 to 115), as measured on the WAIS-R and WISC-R.

INFORMATION REGARDING ACHIEVEMENT AND PROCESSING SKILLS

Although the number of subjects was small, steps were taken to measure and record information regarding the patterns of skills possessed by each student. Such data allowed the researcher to compare the type of strategy use with underlying achievement and processing strengths and weaknesses. Instruments used included those which had been utilized in the detailed screening procedures of the present study: the WRAT Arithmetic subtest, Level 11, and the Passage Comprehension subtest of the Woodcock Reading Mastery Tests. Subtest information from the Weschler Intelligence tests was also part of the information gathered. This was later updated if it was more than a year old. In addition, the Specific Language Disability Test (Malcomesius) was used to obtain measures of visual and auditory processing. These measures included assessment of far copying, near copying, visual discrimination, visual memory (recognition), visual memory (reproduction), auditory discrimination, auditory memory to motor and auditory to visual (recognition). As well, three subtests of the Detroit Tests of Learning Aptitude were given: Verbal Absurdities, Auditory Attention Span for Unrelated Words and Auditory Attention Span for Related Syllables. The Word Identification and Word Analysis subtests of the Woodcock Reading Mastery Tests were administered during the screening procedures but were purposed to serve as vehicles to gain additional information regarding skill development. To gain some knowledge of facility in language, two subtests of the Clinical Evaluation of Language Function (CELF), Processing Relationships and Ambiguities and Producing Formulated Sentences, as well as the Divergent Production, Syllabication and Grammatic Competency subtests of the Fullerton Language Tests for Adolescents were administered. A detailed account of assessment results may be found in Tables 6, 7 and 8. Informal measures of descriptive oral and written language were also included in the battery.

Table 6

Achievement Test Scores

	Woodcock			WRAT
Subject	WID	WA %iles	PC	Math untimed %iles
A	88	84	55	23
B	45	74	28	81
C	36	44	37	47
D	30	30	7	30
E	1	16	1	7
F	9	7	38	66
G	64	85	37	21

Abbreviations: WID = Word Identification
WA = Word Analysis
PC = Passage Comprehension

TASKS

It was the intention of the researcher to utilize a series of tasks which would provide the opportunity to observe the individualized task approach of each subject. Three tasks were chosen to gain information about the subjects' use of strategy. They were the Rods Task, the Test Search Task and the Errand Planning Task. These tasks have been described in detail in the text to follow. Each task made its own unique contribution to the battery.

Table 7

Processing Test Scores

	Malcomesius										Detroit		WISC-R or WAIS-R
	Glances		Errors*										
	FC	NC	FC	NC	VD	VM1	VM2	AD	AM	AV	*Un Words	Rel Syl	Digit Span
Subject	Raw Scores		Raw Scores								Age Scores		Scaled Scores
A	13	22	1	1	0	1	1	2	1	1	8y 8m	8y 0m	11
B	37	7*	1	0	0	0	2	1	4	0	8y 10m	9y 9m	10
C	36	39	0	0	1	0	4	0	6	1	7y 0m	10y 3m	6
D	29	34	6	1	0	2	1	2	10	1	8y 6m	10y 0m	6
E	87	68	0	0	1	2	14	1	19	1	10y 8m	13y 9m	-
F	40	27	2	0	0	1	2	0	7	0	8y 6m	12y 3m	6
G	10	18	0	0	0	0	2	1	1	0	9y 9m	8y 0m	8

*This score is misleading as Subject B tended to keep his eye on the model while writing rather than looking back and forth.

*The age scores for the Unrelated Words subtest represent mean scores based on the simple and weighted age scores.

Abbreviations:

FC:	Far Copying	AD:	Auditory Discrimination
NC:	Near Copying	AM:	Auditory to Motor
VD:	Visual Discrimination	AV:	Auditory to Visual
VM1:	Visual Memory Recognition	Un Words:	Auditory Attention Span for Unrelated Words
VM2:	Visual Memory Reproduction	Rel Syl:	Auditory Attention Span for Related Syllables

Table 8

Language Test Results

	Tests					
	Detroit	Celf		Fullerton		
	VA	R&A	FormSen	DivProd	Syll	GramCom
Subject	Age Scores	Raw Scores		Raw Scores		
A	10y 6m	60(A)	50(A)	33(2+B)	16(at)	18(A)
B	14y 3m	55(A)	59(A)	62(at)	16(at)	19(1A)
C	15y 0m	56(A)	38(B)	37(1+B)	16(at)	19(1A)
D	15y 6m	49(at)	23(B)	55(B)	10(2B)	16(B)
E	14y 0m	57(A)	49(A)	42(1+B)	12(1+B)	19(1A)
F	14y 0m	46(B)	53(A)	51(B)	12(1+B)	15(1B)
G	13y 0m	58(A)	43(A)	52(B)	8(2+B)	18(A)

Abbreviations:
VA = Verbal Absurdities
R&A = Relationships and Ambiguities
FormSen = Formulated Sentences
DivProd = Divergent Production
Syll = Syllabication
GramCom = Grammatic Competency
y = years
m = months
%ile = percentile
at = at criterion or at mean
A = above criterion or mean
B = below criterion or mean
1 = 1 standard deviation
2 = 2 standard deviations
+ = more than

The Rods Task had the capacity to disclose whether the student did or did not use a clearly defined cognitive strategy which according to Stone (1980) might be expected in the majority of adolescents by their fourteenth year. The Text Search Task was a school-related task, which subjects would be required to use frequently in finding information in their textbooks. Finally, the Errand Planning Task tapped the students' social planning skills and included temporal and spatial constraints.

A fourth task, the Self-Ordered Task, was a neuropsychological task which was known to be sensitive to frontal lobe dysfunction in patients with frontal lobe lesions. It was administered to ascertain if there would be any indication of poor performance in students whose characteristics in general task approach and daily living resembled those of some frontal lobe patients.

The first three tasks were presented with similar formats. That is, they were initiated by open-ended questioning which set the goal or gave the intention of the task; they included the opportunity for the researcher to elicit strategies not used spontaneously; they afforded the opportunity for the student to approach the task a second time after he had experienced the elicitaton step; and they did not contain corrective or teaching components. The fourth task was also based on an established goal, yet the achievement of that goal was left up to the student. All tasks involved a type of thinking aloud procedure which permitted the study of transcription protocols. As well, each task involved a manipulative component so that overt behaviour could be video taped and analyzed.

Each task used in the present study was based on a specific standard presentation in which each subject was initially given the same information in the same manner. The same standardized procedure was utilized as the subject moved through various stages of each task. However, in all but the Self-Ordered Task, which adhered to a standardized format throughout, there were interactive elements in the tasks as well. In a sense the researcher became somewhat of a participant observer as the subjects moved through the experiments, questioning her and verbalizing their behaviours as they progressed. One might say that the tasks themselves were standardized while the interactions around them were fairly open. There were, however, restrictions on how much guidance and/or information the researcher would offer. Her verbalizations were primarily repetitions, rephrasings and probings.

Rods Task

Description

Formulated by Inhelder and Piaget (1958), the Rods Task has been used by Stone and Day (1978, 1980), Stone (1980), and Day and Stone (1982) in a number of studies in which the cognitive processing of adolescents was examined. In general, the task involves determining the factors which govern the relative flexibility of a set of rods. These factors have included length, material, diameter, base, amount of weight used to bend the rods, and the positions where weights may be added to the rods. The number of variables utilized change from study to study in Stone's work. The student is shown an array of ten or twelve rods which vary along some of the dimensions just described. (See Appendix C for specifications for the two sets of twelve rods used in the present study.) He is also provided with weights which he will hang on the rods. As well as the materials previously mentioned, the student has a stand into which the rods are placed two or four at a time as weights are hung on them (see Figure 1).

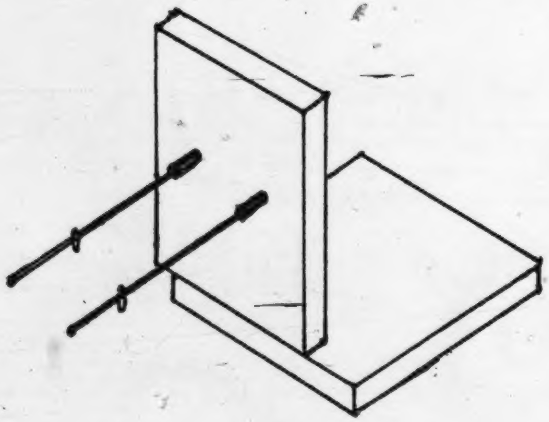

Figure 1: Rods Apparatus

The subject's task is to do whatever tests he needs to do in order to figure out "what makes a difference for bending." Task performance is evaluated on the basis of whether he holds all other variables constant while testing one variable (an unconfounded test) or whether he tests one variable without controlling for other variables (a confounded test). An example of a confounded test of length would be use of a pair of rods which were not only of different lengths but also of different materials or diameters or on which differing weights were placed. In an unconfounded test of length, the rods of varying length would be the same material, the same diameter, and equal weights placed in equivalent positions would be used to judge the degree of bending which would take place.

As mentioned, the studies which have been referenced as the model for the Rods Task have been varied. The 1980 work of Stone and the 1982 study by Day and Stone utilized the variables of length, diameter, material and place of weight attachment. In both these studies a subject who was using the control-of-variables strategy was identified as one who made unconfounded tests of three of the four variables. In his more recent work (see Appendix D) Stone (1983) has incorporated a fixed weight position by attaching a clip to the end of the rod. This fixed position eliminated the position variable. However, varying weights were added as a fourth variable. The subject is provided with two pairs of weights: one pair weighing one ounce each and a second pair weighing two ounces each. A fifth dimension was also added in Stone's later work in the form of a "red-herring" variable. Stone utilized bases of different materials.

While these bases did not make a difference for bending, they did provide the opportunity for demonstration of a confounded or unconfounded test.

In the present study, six variables were used: length, diameter, material base, and weights were employed and as well, students were permitted to hang the weights wherever they chose on their rods: thus position of weight was also a consideration. This last variable, however, was not demonstrated during the elicitation phases of the task.

The Rods Task began by allowing the subject a free performance trial during which he experimented with the rods. Following this display of uncoached strategy, a series of demonstrations occurred. While no teaching took place, the subject was requested to judge between good and poor attempts to test specific variables. This was an elicitation step and no feedback was given. After the attempt to elicit strategy, the student was once again placed in a free performance situation to see if he had learned from the demonstrations. From this approach, it was possible to see if the subject used a previously defined strategy spontaneously, if he could elicit the strategy from making a series of judgments, or if he failed to use the strategy and fell into the strategy absent classification. In the present study a control-of-variables strategy consisted of making unconfounded tests in four of the six variables. The subject was also required to have named the unconfounded variable he was testing.

There are a number of factors which make the approach to the Rods

Task used in the present study variant from that used in Stone's work. The first is the lack of fixed positioning of the weights and the second is in the elimination of some of the more direct guidance. Thirdly, subjects in the present study were given the opportunity to do a final independent test at the conclusion of the experiment. Finally, summative metacognitive questions were included in the present study.

In their earlier work, Stone (1980) and Day and Stone (1982) used three places of weight attachment; at 1/3, 2/3 and 3/3 of the length of each rod. In his later work, Stone (1983) usd only one place of attachment, namely at the end of each rod. This latter procedure follows the method used by Inhelder and Piaget (1958). The free positioning possible in the present study resembles more the choices in the three position variation of the Rods Task than it does the fixed-end position. It requires the student to take into consideration where the weights are placed in drawing conclusions about what matters for bending.

In most cases, the free placement did not interfere with interpretation of the task as the subjects tended to slide the weights on the rods, thus observing when the longer or thinner rods began to bend more. Many subjects utilized the tips of the rods in making their tests choosing a fixed position. Even when they "set" the weights on the rods so that the weights were parallel to one another, it was still evident in most cases which rod bent the most. However, difficulty arose in the comparison of the 60 cm and 20 cm rods of the widest diameter. In such a test a parallel placement of the weights with one weight at the end of the twenty centimeter rod could confuse a student in the early stages of the experimentation as the rods bent equally in what otherwise could have been an unconfounded test of length. This same scenario could occur in the three positioning variation used by Stone, but in that case the student might be more likely to notice the position variable because of the fixed attachment.

In the present study, the writer is reasonably sure that the free positioning of weights caused confusion for only one subject: Subject C, on one test. In this case it was a crucial test. Others incorporated questionable positioning on tests which were confounded by other variables and did not seem confused by the positioning.

The second way in which the present study varied from Stone's work was in the elimination of a directive element in the elicitation phase of the Free Performance Task. In this phase in the Stone procedure, (C. A. Stone, personal communication, June, 1983), the examiner asked the subject if he had finished showing what mattered for bending. If the subject was finished, the examiner reminded the subject of a variable which the subject had mentioned at the onset of the experiment in answer to a question from the examiner: "So now you can see that some rods bend more than others. What I want you to do is figure out why. You may have some ideas already, do you?" (Bending Rods Task Instructions, Stone, 1983). The subject was asked to: "Show me that with a set of rods," and then: "Show me that with another set of rods," if the subject had not made consistently confounded or unconfounded tests of that dimension.

Following tests of these previously mentioned variables the examiner would give the subject an idea of how many variables he had not mentioned and give him the opportunity to contribute suggestions. Repeated tests were elicited in the manner used previously. Finally, any dimension not identified by the subject spontaneously or in response to the queries was named by the experimenter and the subject was asked to show how that dimension influenced bending. Further tests were requested if the subject had not made consistently confounded or unconfounded tests of that dimension (C. A. Stone, personal communication, June, 1983).

In the present study, once the subject felt he was finished testing, the examiner went on to the elicitation phase of Pairs Choice or Final Choice. He was given no indication of how many variables he had missed nor were those variables he could not name given to him. He was not reminded of dimensions that he had mentioned but not tested. In short, no elicitation or teaching took place in the Free Performance Trials; it was restricted entirely to the two elicitation phases.

An additional stage of the present study, not part of Stone's work, was a final chance to see if any further elicitation had occurred through the Final Choice phase. This was an independent test where the subject was asked to demonstrate a choice of rods which was a good test of any variable he chose. This stage required the subject to choose rods according to a dimension he had selected. In essence it was a culmination step. Interestingly, four of the subjects were able to construct unconfounded tests at this stage of the experiment. However, since they were only given the opportunity to test one variable, there is no evidence that the control-of-variables strategy had been elicited.

The metacognitive phase of the present study which extended beyond the Stone studies was one in which the subject was asked to compare the state of his knowledge prior to and following the experiment and to speculate as to what he had learned. Appendix E shows a summary of those responses.

Text Search Task

Readability

This task consisted of asking the student to find an answer to a specific question by looking in a well-organized text. The student was required to determine where in the text the answer should be found and to read to locate that answer. Rather than using one text, two texts were selected from a single series. The Rix Readabiity Formula (Anderson, 1983) was employed to ensure that a given book was appropriate for a particular subject. Table 9 contains a descriptor of the Rix formula. Table 10 gives the results of using the Rix formula on the Heath Science series.

Choosing Appropriate Materials

The Heath series was chosen because the books contained a number of features of external organization such as a Table of Contents, Index/Glossary, clear headings and boldly printed key words. The books were also attractive. The pictures and diagrams were not demeaning to an adolescent. In the examiner's opinion there was

Table 9

The Rix Formula

Rix: A Simpler version of Lix
for estimating reading difficulty
of English Tests by grade level

Directions:

1. Select a sample of sentences from the book to be analyzed. The number of samples depends in part on the size of the book and in part on the consistency of writing. As a guide: for short texts, 10 samples of 10 sentences each, taken regularly through the book, may be sufficient; for longer works, samples of at least twice this size will probably be required. Very short texts may be analyzed in their entirety.
2. For each total sample (excluding headings, captions, etc.):
   (a) Count the number of sentences.
   A sentence is defined as a sequence of words terminated by a full-stop (period), question or exclamation mark, colon or semicolon. However, in direct speech, sequences like "Where?" he asked, and "Go!" he ordered, count as single sentences.
   (b) Count the number of long words (i.e. words of 7 or more characters after excluding hyphens, punctuation marks and brackets).
   A word is defined as a sequence of characters bounded by white spaces. Thus numbers like 1.461 and 10.1, hyphenated sequences, abbreviations, (e.g., IRA, a.m.), dates such as (1981-1982), and symbols like % count as single words.
3. Determine Rix by dividing the number of long words by the number of sentences (work to 2 decimal points).

Interpretation	Rix Score	Equivalent grade level
To find the equivalent grade level of difficulty for Rix, locate the Rix score in the lefthand column and the corresponding grade in the righthand column.	7.1 and above	College
	6.2 and above	12
	5.3 and above	11
	4.5 and above	10
	3.7 and above	9
	3.0 and above	8
	2.4 and above	7
	1.8 and above	6
	1.3 and above	5
	0.8 and above	4
	0.5 and above	3
	0.2 and above	2
	Below 0.2	1

(Anderson, 1983, p. 495)

nothing inherent in the appearance of the text to detract from the task at hand. Finding books at the lower levels of readability which utilized indices was very difficult. Although the combined index/glossary in the Heath series was initially confusing to some students, it did not interfere with the purpose of the task.

Table 10

Comparison of Grade Labels and Readability Levels of Selected Heath Science Texts

Heath Science	Rix Readability Level
*Grade 3	Grade 4
Grade 4	Grade 5
Grade 5	Grade 5
*Grade 6	Grade 4

*selected for use in the study

It was hoped that each subject could be given a book which was approximately one grade level below his Easy Reading Level as measured by the Woodcock Reading Mastery Tests, Form A. (Table 11 outlines the results of the Passage Comprehension subtest of the Woodcock.) However, problems arose with two of the seven subjects in attempting to meet the aforementioned criteria. Subject D's easy reading level was 3.7 and no Grade Two material was available in the Heath Series. Some of the other Grade Two texts investigated were above the Grade Two readabiity level while none contained an index. Subject D was therefore asked to read a passage aloud from the Grade

Table 11

Woodcock Passage Comprehension Reading Levels

Subject	Easy	Grade	Failure
A	8.4	12.2	12.9
B	6.2	8.4	12.9
C	6.9	9.5	12.9
D	3.7	4.9	6.4
E	4.7	6.2	8.4
F	7.2	9.9	12.9
G	6.7	9.2	12.9
$\overline{X}$	6.3	8.6	11.2

Three Heath Science text. He read fluently and with understanding. He also had no difficulty with the text in the task itself.

Subject A's Easy Reading level was four grade levels above the readability level of the text used. However, although he had no difficulty with reading the book, he was unable to cope with the task. A comparison of Easy Reading Grade Level scores on the Woodcock and Heath Science Texts is found in Table 12.

Description

Students were assured that the task they were about to begin was "more a matter of finding things than of reading." They were also told that the book would be easy for them to read.

Table 12

Text Placement and Readability Compared to Easy Reading Level on the Woodcock

Subject	Woodcock Easy Reading Level	Heath Science Text Used	Rix Readability
A	8.4	Grade 6	Grade 4
B	6.2	Grade 6	Grade 4
C	6.9	Grade 6	Grade 4
D	3.7	Grade 3	Grade 4
E	4.7	Grade 3	Grade 4
F	7.2	Grade 6	Grade 4
G	6.7	Grade 6	Grade 4

The session was divided into three parts. The first part consisted of an introduction of the materials, a demonstration of the principal features of the text (without describing their use) and an open-ended instruction to "find the answer to this question." The second part of the Text Search Task consisted of two three-part demonstrations of text utilization in order to find an answer to a question. Basically, the first method was a random "flipping" technique (Type 1 strategy); the second, a use of the table of contents followed by paging through a chapter (Type 2 strategy); while the last method used the index for more precise location of the topic (Type 3 strategy). The student was asked to judge the best of the three demonstrations and to justify his choices. No feedback was provided. This second part was an attempt to elicit skills not displayed spontaneously. The third part of the sessions consisted of a repetition of part one. Samples of the types of questions may be found in Appendix F while Appendix G contains the detailed guide for presenting the task.

Errand Planning Task

The basic theory upon which the Errand Planning Task was based is presented in the work of Hayes-Roth and Hayes-Roth (1979), Hayes-Roth (1980), and Goldin and Hayes-Roth (1980) as they have investigated individual differences in planning a day's errands. The task was modified to conform to the Trial One - Elicitation - Trial Two Model used in the previous tasks.

Description

A series of hypothetical errands to be done in a single day were presented to each student. The subject was asked to formulate a realistic plan indicating which errands would be done, when they would be done, and the method of travel among them. The subject was presented with both verbal and written scenarios describing the errands and some of the time constraints. As well, a two-dimensional map was given to students. On the map, streets were depicted by electrical tape, buildings by magazine photographs, bus routes by coloured strips on the road surface, and bus stops by a card bearing the letter B. The student's task was to decide which of the errands he could do, the times he could do them, and how he could get around--would he walk or take a bus for example. His performance was judged on the way he sequenced the events into the time frame. See Figure 2 for the map outline.

The scenario was as follows:

> It is 1:30 p.m. and you have just finished a class. Your next period is a spare so you are free to leave the school or spend the time studying. You have an exam in your first period tomorrow morning and you need to study for at least two hours. You have a dental appointment at 4:30 which you cannot miss but you know that your dentist seldom keeps you waiting and that you should be out by 5:15. Tonight a friend and his (her) parents are giving a party for another friend who is moving to Calgary. Most people are arriving at 7:30 but food will not be served until 8:30. You want to be asleep between 10:30 and 11:00 so that you are not too tired for your exam. Your other errands are as follows:
>
> - pick up potato chips for the party
> - buy a record as a present for your friend
> - return a book to the library
> - meet a friend for a quick hamburger so you will last until 8:30
> - go home and get ready for the party
> - take your dog for a run
> - watch your favourite T.V. show at seven
> - take your bike to the repair shop
> - take some baking to your grandparents' home

The session was divided into three parts. The first part consisted of an introduction of the materials, demonstration of the use of the map, and an open-ended instruction as indicated earlier. The second part of the Errand Task consisted of a series of questions in which the student was to judge the better of two plans, one of the alternatives being well planned (showing the clustering of events in an efficient manner) and the other being poorly planned (showing inefficient use of time and space). The student was asked to justify

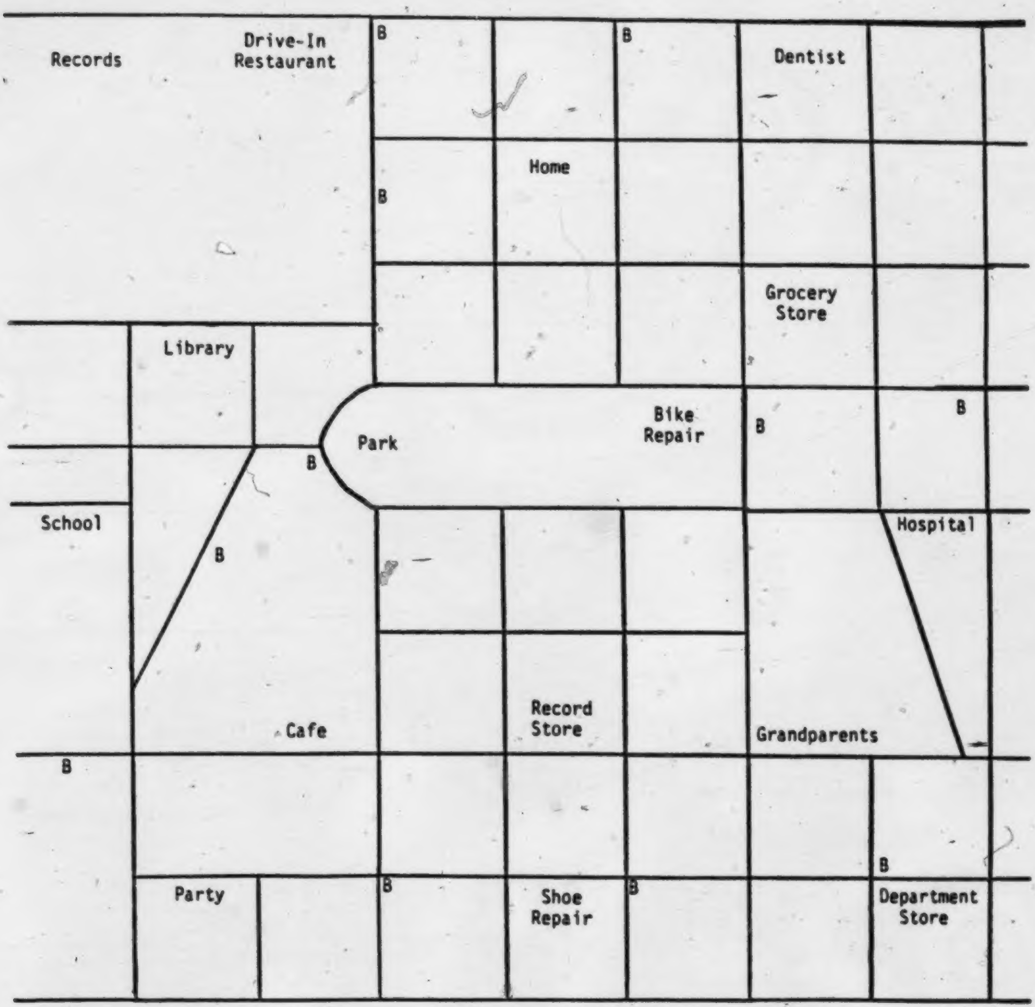
B
B
Records
Drive-In Restaurant
Dentist
Home
B
Grocery Store
Library
Bike Repair
B
B
Park
B
School
Hospital
B
Cafe
Record Store
Grandparents
B
Party
B
Shoe Repair
B
B
Department Store

Figure 2: Map outline used in the Errand Planning Task

his choices but no feedback was provided. The third part of the session consisted of a repetition of part one. A detailed explanation of the task may be found in Appendix H.

Self-Ordered Task

Description

The Self-Ordered Task used in the present study was designed by Petrides and Milner (1982). The task required the subject to organize and to carry out a sequence of responses. The stimulus material consisted of abstract designs which had been devised so that they were not difficult to distinguish visually but rather hard to code verbally. The task itself was subdivided into sections consisting of pages containing sets of six, eight, ten and twelve items. No item was used in more than one set. That is, drawings used in the formats of six items were not found in any of the other set formats. Three consecutive trials of each set were given and the pages containing six stimuli were always given first, followed by the eight, ten and twelve item sets. In this way a subject would be given a total of eighteen pages in the section dealing with six items, twenty-four for the eight-item set, thirty for the ten-item set and thirty-six pages in the section requiring him to examine twelve drawings. On any given trial, the subject was presented with a pile of sheets of paper consisting of the entire set needed to administer all three trials of that particular set. Blank sheets of paper separated each trial from the next trial in the set.

Subjects were requested to touch only one picture on each page and not to touch one picture more than once in each trial. In that way the subject was actually touching the pictures in sequence according to a plan which he initiated and monitored. An example of the first page of the six-item display is found in Figure 3. In the Self-Ordered Task no time constraints were imposed; however, the subject was cautioned not to go too quickly or he would not have time to examine all the pictures and not to go too slowly or he might forget which drawings he had already touched. The instructions used with the subjects appear in Appendix I.

METACOGNITION

There were four metacognitive elements in the present study:

Questionnaire on Organizational Skills
Interview Regarding Study Habits
Ongoing Interactions
Task Specific Sessions

Questionnaire on Organizational Skills

Description

A twenty-one item questionnaire was developed which paralleled the Questionnaire given to two of each of the subjects' teachers as part of the screening process. The format of presentation of the Questionnaire differed from when it was given to the teachers in that it was altered from a paper and pencil task, where answers on a four-point scale were selected, to a discussion format much like that used in the Interview. Audio recordings were made of their

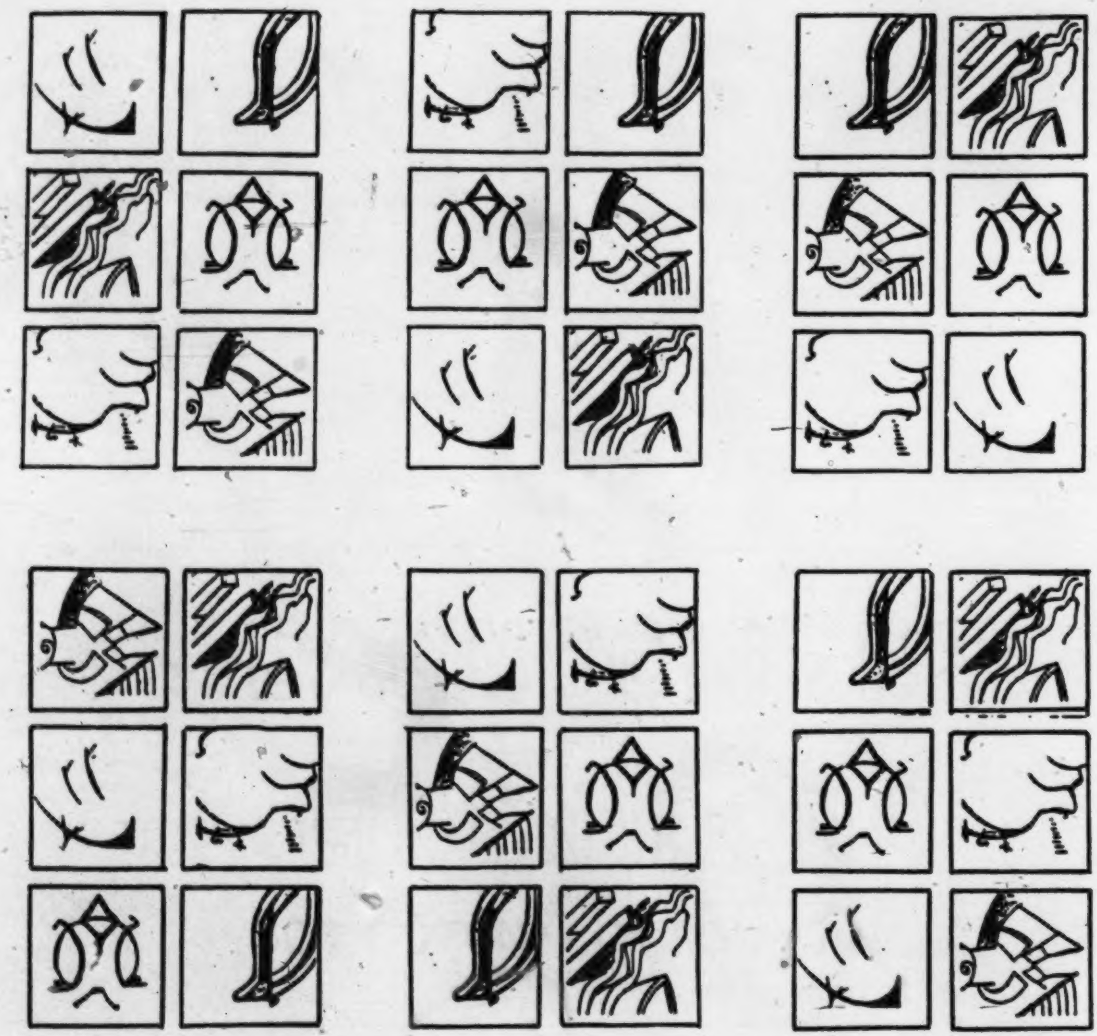

Figure 3: Randomly arranged 6 items of the Self-Ordered Task

discussions. The Questionnaire may be found in Appendix K.

Interview Regarding Study Habits

Description

A nine-question guide was constructed to elicit information from the subjects regarding their knowledge and feelings about their abilities and their study habits. A general question on why some people do well in school was also included. The interview was conducted in a conversational manner with probes being used to elicit more information where necessary. Once again, audio recordings were made. The Interview may be found in Appendix J.

Ongoing Interactions

Description

Students were encouraged to talk aloud as they completed the four tasks comprising the present study. A talk aloud procedure was demonstrated to and practised with the subjects through a demonstration game of X's and O's before the formal study began. Students were encouraged to describe what they were doing as they worked but not necessarily what they were thinking. All tasks were both video and audio taped.

Task-Specific Understandings

Description

At the conclusion of each task, a series of questions were posed to help to discover the student's metacognitive understandings of the processes and learnings he had experienced. These verbalizations could be compared with the subject's actual task approach and gave insights into his understandings of the task as well as his own cognitive processes. All metacognitive questions used are found in Appendix L.

PROCEDURES

1. School Board permission to conduct the study was obtained.
2. Learning Assistance and Resource Room teachers at the respective high schools were requested to supply the researcher with names of those considered to be learning disabled adolescents.
3. Screening procedures followed the criteria listed under the Initial Screening section of the present chapter were implemented as outlined.
4. Teachers in academic and less academic settings were asked to assess students' organizational abilities by filling in a Questionnaire.
5. Background information in intellectual, achievement, processing abilities was gathered. All procedures were individualized. Parental permission for testing was sought and granted prior to this aspect of the data collection.
6. The Rods, Text Search and Errand Tasks were administered following a Trial-Elicitation-Trial format. The technique was interactive for all the tasks. Probes were primarily designed to enhance the researcher's knowledge of what the student was thinking as he worked. No evaluative remarks were made. Task

and metacognitive sessions regarding the tasks were videotaped and recorded on audiotape.

7. The Self-Ordered Task was administered. Video and audio recordings were made.
8. The Interviews and Questionnaire discussions were conducted with the subjects and recorded on audio tape.
9. Further background on the students' oral and written language skills was gathered.
10. All verbal exchanges made during the task and metacognitive portions of the study were transcribed and analyzed.
11. Video recordings were analyzed to supplement information on the audio tapes and provided a unique contribution to the study.

RECORDING DATA

In studying individual strategic task approach and the organization of behaviour towards an imposed goal, four sources of information were available:

1. Observational notes and checklists recorded during the completion of the tasks.
2. Transcripts of all verbalizations made during task performance and during the questioning to gather metacognitive information.
3. Transcripts of all verbalizations made during the Interview and Questionnaire discussions.
4. Video tape recordings of behaviour. (These formed the principal basis for any timed performance comparisons and were important sources for nonverbal behavioural analysis.)

Observational Record Keeping

The Rods Task

Written notations were made of the rods selected for each phase of the experiment. Recordings included the first free choice, the pairs choice, the second free choice, and the final choice selections. As well, brief written information was recorded on the construction of the independent test and key words of the metacognitive responses were noted.

The Text Search Task

A simple checklist helped in recording whether the subject had used a Type 1, 2 or 3 strategy in the first free choice and the second free choice. Choices on the elicitation phase were also recorded. A summary of verbalizations using key words was made in the metacognitive phase.

The Errand Planning Task

A summary of each subject's verbalizations was made under the headings: First Free Plan; Choice; Second Free Plan; and Metacognition.

The Self-Ordered Task

Three squared sheets for each set of 6, 8, 10 and 12 drawings allowed the examiner to check the square pointed to by the student. The rapid nature of this task precluded the taking of observational notes.

Verbalizations

Nature of the Verbalizations

Verbal protocol analysis is described in the study of strategies used in problem solving (Simon and Simon, 1978) and in reading comprehension (Kavale and Schreiner, 1979; Kavale, 1980). According to Olsahvsky (1976-77), protocol analysis requires the subject to think aloud as he works, a technique learned and practised prior to the experimental exerience. It is an introspective technique in that the task requires the subject to "report his process as it occurs" (Olshavsky, 1976-77, p. 661) when he was completing the task. The latter method requires the subject to theorize about what he has done while the former asks him to talk as he goes. This definition of introspection is somewhat more liberal than the more traditional approach which required that the "subjects become detached or external observers of their own consciousness" (Aanstoos, 1983, p. 250).

The present study utilized both introspective and retrospective elements. The subject was asked to think aloud as he worked but was also asked to think back about his task performance in a descriptive and evaluative manner. As well, he was asked to think in a predictive sense. For example, on the Rods Task, forward-looking probes such as "What do you think will happen?" were asked before the trial began, while the performance was followed by retrospective questions such as "What did you learn about bending from these rods?". Students were also encouraged to explain their rod choices as they worked. More detailed information regarding the specific questions asked may be found in the task administration procedures.

In the present research, a study was also made of the students' knowledge about their cognition. Few studies investigating the type of retrospection referred to as metacognition are as detailed and precise as the Meyers and Paris (1978) interview study which investigated twelve-year-olds' metacognitive awareness of variables which influence reading. These questions have been used as models for some of the metacognitive questioning used in the present study. Metacognitive components were included in an attempt to sharpen the present picture of inefficient task approach.

> Since the development of children's metacognitive knowledge is associated with efficient learning, remembering and communicating, it may provide a critical link in explaining the transition from a novice to a sophisticated problem solver. (Meyers and Paris, 1978, p. 680)

Once the verbal data was gathered, it was examined against the Luria (1973b) framework and probed for what other information it could yield.

Utilizing Transcripts

Several approaches have been taken in the literature to the analysis of transcripts of research proceedings. The verbal protocol technique of Newell and Simon (1972) is a widely quoted methodology and has been used to study problem solving in cryptoarithmetic, logic and chess. In this method, protocols are set up by recording what the subject says as he solves a problem. The protocols are verbatim transcripts of the session with the subject "thinking aloud" as he works.

Glass, Holyoak and Santa (1979) have outlined a step by step description of protocol analysis and have said:

> The first step in doing a protocol analysis is to break up the transcript into fragments that correspond to different states of the subject's knowledge or mental activity. This division is done intuitively by the experimenter. The result is a series of labelled statements . . . (p. 413)

The next step is to identify the general type of approach the subject is taking to the problem. Once that approach or "space" has been identified the experimenter isolates the subject's specific operations as he moves from one knowledge state to another. At this point behaviour graphs or schematic outlines for the problem solving process are designed. In these graphs, boxes represent new knowledge states and arrows represent the operations which change one knowledge state to another and the nature of the subject's thought processes are easily followed.

Hayes-Roth and Hayes-Roth (1979) also utilize thinking-aloud protocols. Subjects are asked to plan a day's errands and describe "their observations, reasoning, thoughts and decisions while developing their plan" (Goldin and Hayes-Roth, 1980, p. 13). The goal of the Goldin and Hayes-Roth (1980) study was to "identify features of the planning process that distinguish good planners from poor planners" (p. 2). Once recorded, protocols are divided into units with each segment representing a decision. The protocols are then examined for statements which relate to the opportunistic model developed by Hayes-Roth and Hayes-Roth (1979).

> . . . in contrast to some other protocol coding methods (cf. Newell and Simon, 1972), we chose to analyze only the surface content of the protocols, that is, decisions that were openly verbalized, rather than infer the content of subject's covert processing. (Goldin and Hayes-Roth, 1980, p. 15)

In the Goldin and Hayes-Roth (1980) approach, good plans are defined in a quantitative manner. Five criteria are set up and then operationalized each on a 100 point scale (see Table 13).

Following what he terms a phenomological approach, Giorgi (1975) initially outlines his descriptive data by verbatim transcriptions of the utterances of the researcher and subject. The first analytic step he takes is to divide the subject's expressions into natural meaning units. The verbalizations remain unaltered but are separated into units of meaning and enumerated. Separations are made at the researcher's discretion and no reference to the purpose of the study is made when considering the divisions. "By so deliberately avoiding concentrating attention on any pre-determined aspect, the researcher is able to escape the danger of finding only what one expects to see" (Aanstoos, 1983). These natural meaning units described by Giorgi are recorded in the left hand column of a table while in the right column the researcher states in simple terms the central theme of each unit. These central themes are then placed into a second table, the first column listing statements answering "what" or structure questions and the second answering "why" or style questions. The next step is to attempt to "tie together into a descriptive statement

Table 13

Rules for Scoring Plans Against Evaluation Criteria, Goldin and Hayes-Roth (1980)

Criterion	Rule
Number of Errands Accomplished	Score = % of requested errands planned and executable in available time
Number of Important Errands Accomplished	Score = % of important errands planned and executable in available time (importance value 4.0)
Realism	$\text{Score} = 100 - \frac{100 \times (\text{Time to execute plan} - \text{Time available})}{(\text{Time Available})}$
Route Efficiency	$\text{Score} = 100 - \frac{100 \times (\text{Planned route length} - \text{Optimal route length})}{(\text{Optimal route length})}$
Explicit Constraints Satisfaction	Score = % of time constrained errands specified in scenario that could be satisfied if the plan were executed

the essential, non-redundant themes" (Giorgi, 1975, p. 88). Giorgi (1975) points out that the descriptions can be specific to the situation or more transsituational. These descriptive statements are summative in nature and can be reported in individual tables which are classified into "what" (structure) and "why" (style) categories. According to Giorgi (1975) the methodology just outlined is a demonstration of "how one deals systematically with data that remains expressed in terms of ordinary language" (p. 96). Such data differs from the schematic drawings of Newell and Simon (1972) and has none of the attempts to quantify found in the work of Goldin and Hayes-Roth (1980).

The present study utilized aspects of all three of the methods which have been discussed. For example, analysis included attempting to match data to the Lurian organizational framework utilized in the questionnaire much as Goldin and Hayes-Roth (1980) match their data to the opportunistic model. Close comparison of the subjects' work was made as is done in the research of Simon and Simon (1978). An examination of the data following Giorgi's (1975) approach was employed as an efficacious and less structured manner of data reduction and exploration. The aspect of the Giorgi (1975) technique which has the researcher look for comments which are specific to the given situation and those which are transsituational was a particularly interesting application in the present study. Brown and Palincsar (1982) have discussed the relative value of training specific, general and intermediate-level strategies to task approach. The tasks in the present study provided a rich information source from which to obtain such profiles. While the present study is not pure phenomenological research, it employs many techniques of the methodology.

PHENOMENOLOGICAL ASPECTS

The present study followed a more traditional experimental approach to research in that it utilized operational definitions and a standardized presentation of task requirements. In some aspects of the study, subjects were observed according to preconceived frameworks; however, there was also an attitude of openness about the study which was reflective of the phenomenological aspects of the design. In the present study, interactive elements in which the subject sought and received clarification were permitted. Restrictions were not placed on the number of repetitions of instruction. Subjects were also encouraged to describe their actions, their thoughts and their reactions. In phenomenology, "one is still bound by the phenomenon, and one still has the obligation to be systematic and rigorous" (Giorgi, 1971a, p. 14). In a truly phenomenological approach, methodology is devised to fit the phenomenon. Insofar as the methodology adopted in the present study utilized probes and varied cueing dependent on the subject's performance, the methodology was not standardized. As well, each subject's individualized task approach was accepted, for it was just that individuality which was of interest. Each task utilized was initiated by an open-ended question and the role of the researcher was more of one who described than one who measured. "The method of phenomenology essentially involves the process of intuition, reflection and description" (Giorgi, 1971a, p. 10).

Quantitative factors were involved in drawing conclusions about some of the frameworks, however. For example, the determinant of spontaneous use of control-of-variables strategy in the Rods Task was use of four of the six variables in unconfounded tests. Yet the study is essentially more research than experimentation. Giorgi (1975) defines phenomenology as "the study of the structure, and the variations of structure, of the consciousness to which any thing, event or person appears . . . elucidating both that which appears and the manner in which it appears . . . " (p. 83).

SPECIFIC ANALYSIS PROCEDURES

Academic Skills Assessment

Tests

The following tests and subtests were administered individually to each of the seven subjects:

1. *Weschler Intelligence Scale for Children - Revised* (*WISC-R*) or *Weschler Adult Intelligence Scale Revised* (*WAIS-R*).
2. *Woodcock Reading Mastery Tests*
    - Word Identification
    - Word Attack
    - Passage Comprehension
3. *Wide Range Achievement Test*
    - Arithmetic Subtest

4. Specific Language Disability Test (Malcomesius)

    Test 1 - Visual to Motor

    Test 2 - Visual to Motor

    Test 3 - Visual Discrimination

    Test 4 - Visual Memory

    Test 5 - Visual Memory to Motor

    Test 6 - Auditory Discrimination

    Test 7 - Auditory Memory to Motor

    Test 8 - Auditory to Visual

5. Detroit Tests of Learning Aptitude (Detroit)

    Test 2 - Verbal Absurdities

    Test 6 - Auditory Attention Span for Unrelated Words

    Test 13- Auditory Attention Span for Related Syllables

6. The Clinical Evaluation of Language Functions (CELF)

    Subtest 4: Processing Relationships and Ambiguities

    Subtest 11: Producing Formulated Sentences

8. The Fullerton Language Test for Adolescents (Fullerton)

    Subtest 5: Divergent Production

    Subtest 6: Syllabication

    Subtest 7: Grammatic Competency

8. Students were asked to describe orally a thematic picture from which a narrative story could evolve.

9. Using another picture, which again lent itself to description but was much more abstract in nature than the picture used in #8, subjects were asked to tell the story of the pictures in writing.

Analysis

Tests were scored, and the information gleaned formed part of the case study profiles found in Chapter VI. Where appropriate, task performance and verbalized opinions were related to these performance scores. Detailed information on the results of these measures may be found in Tables 6, 7 and 8 of the present chapter on Methodology.

Tasks

The Rods Task

Determination was made of

- the differences in use of confounded and unconfounded tests from free choice trial one to free choice trial two
- the accuracy of choices in determining the best pair of two pairs to test a particular variable
- the effect of elicitation procedures on control-of-variables strategy and variable identification in the subsequent trial
- the subject's ability to identify good and poor tests of specified variables following elicitation
- the qualitative and quantitative differences in subjects' responses to the question "What makes a difference for bending?" prior to and following the experiment
- the subject's classification as strategy absent, elicited strategy user or spontaneous strategy user based on his employment of the control-of-variables strategy on the first and second free choice trials

- the subject's verbalized understandings of what he had learned from doing the Rods Task.

The Text Search Task

Determination was made of

- the subject's success in finding the information required of him in the first trial and second trial
- the types of strategies used in trials one and two (random flipping; use of table of contents and use of index)
- the effects of the elicitation procedures on the subsequent approach to the task
- the types of strategy selected by the subject during the demonstrations (elicitation procedures)
- the subject's classification as strategy absent, elicited strategy user or spontaneous strategy user based on his performance on the first and second trials of the Text Search Task
- the subject's verbalized understandings of what he had learned from doing the Text Search Task.

The Errand Planning Task

Determination was made of

- quantitative factors of movement, time and errands in the three trials
- the effect of elicitation procedures on use of movement, time and errand references in the subsequent trial
- the accuracy of choices on demonstration items (elicitation)

- the subject's classification as a spontaneous or elicited user of time, movement and errand references
- the subject's verbalized understandings of what he had learned from doing the Errand Planning Task

The Self-Ordered Task

Determination was made of

- the total number of errors made by each subject on each set of the Self-Ordered Task
- mean times per set category
- speed of performance ranking
- the number of times one position was successively touched

The information gathered by observation and analysis of data from the four tasks has been reported separately for each task and incorporated in the Case Studies on each subject. Task results may be found in Chapter V and in the Case Studies in Chapter VI.

Metacognition

The Questionnaire on Organizational Skills and the Interview Regarding Study Habits were both conducted in a manner which is close to what Denzin (1970) refers to as the nonscheduled standardized interview or focused interview "in which certain types of information are desired from all respondents but the particular phrasing of questions and their order is redefined to fit the characteristics of each respondent" (p. 125). Each subject clearly understood the researcher's purpose in conducting the study and knew that he would not be referred to by name. Lofland (1971) as cited by Goetz and LeCompte (1984)

> emphasizes that the interviews are conducted more smoothly when prefaced by a brief statement of research purpose, (and) by assurances of protection of respondent identity . . . (p. 129)

Goetz and LeCompte (1984) also stress the importance of effective probing, a technique which was also employed in the present study. However, probes were only employed when necessary to secure elaboration or clarification. It was the examiner's intent to conduct the interviews insofar as possible in a conversational manner.

Metacognitive probes which followed the completion of the Rods, Text Search and Errand Planning Tasks were characterized by the same descriptors just outlined for the Interview and Questionnaire.

Questionnaire on Organizational Skills

Procedure

The questionnaire used with students closely parallelled the initial screening questionnaire filled out by teachers and used to help identify the subjects as disorganized. Transcripts from the questionnaire were analyzed in a manner modelled after the work of Giorgi (1975), which suggests frameworks for data reduction and data interrogation of verbal protocols. The procedure followed is outlined below:

Step One:

All exchanges were transcribed verbatim.

Step Two:

The subjects' verbalizations were segmented into meaning units by examining the transcripts in an open manner with as little consideration of the aims of the study as possible.

Step Three:

All meaning units were restated as simply as possible as themes.

Step Four:

The twenty-one questions were grouped into the six skills which they were designed to tap. These skills were:

1. general organization (Questions 1, 7 and 13)
2. planning (Questions 2, 9, 14 and 19)
3. inspection (Questions 3, 8 and 15)
4. regulation (Questions 4, 10, 16 and 20)
5. verification (Questions 5, 11 and 17)
6. correction (Questions 6, 12 and 18)

Step Five:

Each subject's responses were summarized under the individual questions making up the skill, i.e.:

General Organization

Question #1: Are you on time for class?

Subject A: on time
B: usually 10 or 15 minutes late
C: on time
D: basically on time
E: hard to be on time in the morning
F: usually on time--sometimes late
G: on time except for first period in morning and after lunch

(See Appendix M for the remainder of the summaries.)

Step Six:

A second series of summary statements were constructed for each skill by grouping the summary statements for the questions under each individual subject. For example, under the General Organization Skill each subject's name was followed by three descriptors for each of the three questions making up the skill, i.e.:

General Organization

Subject A: is on time
is tidy
has materials on hand

Note: These groupings were particularly useful in constructing the individual case studies. (See Appendix N for the remainder of the summaries.)

Step Seven:

The responses for each question were classified and then quantified. A table was constructed for each question (see Table 62 as an example).

Step Eight:

The information in the tables was discussed.

Step Nine:

A final summation on the skill was made.

Step Ten:

A procedure was devised whereby the examiner could rank subjects' responses and compare them to the relative rankings of their teachers' ratings on the Questionnaire on Organizational Skills. Transcripts and summary statements were consulted in this step. Answers to the twenty questions on the Questionnaire were first categorized as "Yes," "No" or "Sometimes" responses. "Yes" and "No" statements were those strongly affirmative or negative while all those answers of a less polar nature were labelled "Sometimes." Summary sheets for each subject including all twenty questions under the six organizational categories were developed. An example follows:

Subject G:

Planning

Question 2: Situation dependent
9: Yes
14: Yes
19: Affirmative response

Step Eleven:

Answers to the twenty questions of the Questionnaire on Organizational Skills were also examined to see if subjects gave some further information beyond an agreement or disagreement to the queries. Those answers with additional information were further labelled with the descriptor example.

The example descriptor was utilized if an example occurred somewhere in the interaction between the examiner and the subject, despite the number of probes required to draw out the example. To further examine the subjects' spontaneous knowledge, the examiner labelled all examples given following the initial question and prior to any further probes as spontaneous example. An example follows:

Subject G:

Planning

Question 2: Situation dependent (spontaneous example)
9: Yes (example)
14: Yes (spontaneous example)
19: Affirmative response (spontaneous example)

Step Twelve:

Quantification of the responses was achieved by assigning a "yes" or clearly affirmative response a 3; a "Sometimes" or situation dependent response a 2; and a "No" or clearly negative response a 1, i.e.:

Subject G:

Planning

Question 2:	Situation dependent (spontaneous example)	2
9:	Yes (example)	3
14:	Yes (spontaneous example)	3
19:	Affirmative response (spontaneous example)	3

Step Thirteen:

A further step of establishing ratio scores allowed the researcher to establish relative performances for each skill. For example, in Subject G's case as illustrated in Steps Ten, Eleven and Twelve, the highest score possible would have been 12, achieved from four "Yes" responses. Since Subject G had three "yes" responses and a situation specific response, he achieved a total of 11 points. The ratio established was then 11/12.

Step Fourteen:

Ratio scores were converted into decimal scores, which yielded figures which could be compared more easily. The individual's highest and lowest ratings from the six categories were then determined. An example follows:

Subject B:

General Organization:	.55	lowest
Planning:	.75	
Inspection:	.78	
Regulation:	.75	
Verification:	1.00	highest
Correction	.89	

Step Fifteen:

The rankings established in Step Thirteen were compared with the way teachers in academic and less academic settings had ranked the same subject, i.e.:

	Highest Rating	Low Rating
Subject E:	Correction	Verification
Less Academic Setting:	Correction	Verification
Academic Setting:	General Organization	Regulation

Step Sixteen:

Transcripts were examined for preciseness. A series of descriptors was developed as follows:

1. A single word response. In general these were Yes/No/ Sometimes resonses which were labelled word. If the word gave other information such as "Lost," it was labelled word - precise. Descriptive names of subjects such as "Social Studies" were also labelled word - precise.

2. A comment. Essentially those unitary ideas expressed in one phrase or single sentence statements were labelled comment. They were further described in the following way:

a. Precise comment: A comment which gave the reader a clear idea of a specific action or understanding and probably a sense that the subject was describing what he actually would do.

Questionnaire Meaning Unit (in part) #7 (Subject A)

Examiner:	. . . Like, let's say it's a Math question and you've asked for help and you still don't know what to do - would you - what would you do?
Subject A:	I'd just go on to another one. **[Comment (precise)]**
Examiner:	Another question?
Subject A:	Yeh. **[Word]**
Examiner:	And leave it?
Subject A:	Yeh. **[Word]**

b. General comment: A comment which gave only a general idea of an action or understanding and may, because of its generality, leave the reader less assured of having read a true reported action.

Questionnaire Meaning Unit #13 (Subject A)

Examiner:	Do you do that sort of thing usually or would you only do that if you thought there was something wrong?

Subject A: I'd do it if I thought something was wrong. **[Comment (general) (parroting)]**

Examiner: But you wouldn't redo every question?

Subject A: No **[Word]**

3. An elaboration. A descriptor of more than one sentence or phrase extending the unitary idea usually by example.

a. Precise elaboration: An elaboration which gave the reader a clear idea of a specific action or understanding and probably a sense that the subject was describing what he actually would do.

Questionnaire Meaning Unit #10 (Subject C)

Examiner: Umhm. You said that you underlined things, then ~~what~~ do you do with that?

Subject C: O.K. Well, umm - Say I'm writing, I've gotten an idea to put in, then I'll write it down and if I - O.K - spelled a word wrong, then I'll underline it and then after I've finished the rough copy, type of thing, I'll go back and get it spelled right or the sentence rearranged or.. **[Elaboration (specific)]**

b. General elaboration: An elaboration which gave only a general idea of an action or understanding and may, because of its generality, leave the reader less assured of having read a true reported action.

Questionnaire Meaning Unit #30 (Subject D)

Examiner:	Would you describe yourself as an organized or a disorganized person?
Subject D:	Sometimes I'm organized, sometimes I'm not. **[Comment (general)]**
Examiner:	O.K. What makes you organized, what makes you disorganized?
Subject D:	Uh, guess the way I feel that day or if I woke up on the wrong side of the bed, I would be disorganized altogether. If I got up on the right side, I'd be organized - how I feel that day. That's about it. **[Elaboration (general)]**

Step Seventeen:

Statements labelled as directed in Step Sixteen were also examined carefully to see if they reflected the spontaneous intent of the subject or whether they parroted, agreed or disagreed with the examiner's comments. Subject A's responses as reflected in Meaning Unit #13 quoted as an example of a general comment above simply repeats the examiner's words and thus the term parroting is added to the labeling of the unit.

By the above examples it may be seen that a single meaning unit could contain more than one utterance and therefore conceivably a combination of words, comments and elaborations could be found within one meaning unit. Further criteria for this labeling may be found in Appendix O.

Note: Results of the Questionnaire analysis are found in Chapter V. Details of the data analysis are in Appendices Q through V.

Interview Regarding Study Habits

Procedure

The interview under discussion was based on the subjects' knowledge and feelings regarding their abilities and study habits. These interviews were analyzed in a manner similar to that utilized by Giorgi (1975). The steps in the analysis included data reduction and interrogation of the data and were as follows:

Step One:

All exchanges were transcribed verbatim.

Step Two:

The subjects' verbalizations were segmented into meaning units by examining the transcripts in an open manner with as little consideration of the aims of the study as possible.

Interview Transcription (Subject C)

Examiner: O.K., so you think that the main reason why people do well in school is that they take the time and put more effort into it.

Subject C: Umhum.

Examiner: Anything else?

Subject C: Mmm, [things come easier to them.

Examiner: What do you mean by things?

Subject C: Umm, they find it easier to, umm, learn things, and learn, you know, the subject, and uh things like that.] 14

Examiner: O.K. What do you do when you're left pretty well on your own to do an assignment like, say, writing an essay? What would you do in a situation like that?

Subject C: Umm. [Study up on it and make notes on
what it says and take the text and
whatever we've got to study from and
then I don't think if a person takes it
just right out from the book, they're
not learning anything, obviously, and I
try to put it in my own words,] whether, 15
you know, sometimes [I try to get the
point across and don't really so I
don't do so well and then others I will
do quite well.] 16

Examiner: Umhum. So you feel quite comfortable about doing something like that on your own.

Subject C: [Umhum, oh, yeah.] 17

Examiner: And that's the procedure you follow.

Subject C: I don't - yeah - [I don't like working with another person, you know - because that tends to ruin it [Laughs] They don't, together, we don't get exactly the right - you know, we spend more time talking and doing something else than working and it doesn't turn out so well.] 18

Examiner: O.K. You said the "other materials." What would be some of the materials that you would use?

Subject C: [Um, well, it would depend on what it is, like if we're doing (indiscernible) then it would be more of an encyclopedia, something like that.] 19

Step Three:

All meaning units were restated as simply as possible as themes, i.e.:

Meaning Unit #18 from Interview Transcription (Subject C)

Subject C: I don't - yeah - I don't like working with another person, you know - because that tends to ruin it.

> [Laughs] They don't - um - together we don't get exactly the right - you know, we spend more time talking and doing something else than working and it doesn't turn out so well.

Interview Theme #18 (Subject C)

Feels working with a partner is not efficient.

Interestingly, in the case of the less verbal students extracting an interview theme did not always mean a condensation of the unit but with some statements it meant elaborating on the terse responses, i.e.:

Meaning Unit #5 from Interview Transcription (Subject A)

Examiner:	Have you ever been interested in Social Studies or English in the past? [Subject had previously singled out these subjects as difficult areas.]
Subject:	No.
Examiner:	It's always been something you haven't liked very much?
Subject A:	Yeah.

Interview Theme #5 (Subject A)

He has never been interested in or liked Social Studies or English (response to examiner's suggestions).

Step Four:

Summary descriptors were written for each subject's responses to the following groups of questions:

1. 1 throught 2b
2. 3
3. 5

4. 4 and 4a
5. 9

Note: The above numbers correspond to question ~~numbers from the~~ Interview Regarding Study Habits found in Appendix J. For these summaries, both thematic statements and the original transcripts were consulted.

Step Five:

Summary tables for each of the five summaries were constructed and the results outlined. Those summary descriptions, tables and results follow the present procedural outline.

Step Six:

Each meaning unit and corresponding theme for Questions 3, 4, 6, 7 and 9 was then examined to see if it gave either an indication of the student's knowledge of his study and work habits and/or if it revealed an awareness of how he regulated those habits. The procedure was one of labelling the theme appropriately. Giorgi (1975) would refer to this procedure as interrogating the data in terms of the questions of the study.

Interview Theme #7 (Subject C)

> Found school hard because he found it difficult to read **[knowledge of]** and felt he should have taken more time **[awareness of the need for a regulatory action]**.

Decisions as to whether to place a "knowledge of" or "regulatory" label on a statement were guided by the work of Brown and Palinscar (1982) quoted in Table 14 of the present study. Essentially, knowledge about cognition was assigned to statements reflecting the subject's conscious access to knowledge of his behaviours and study habits while regulation statements were those which revealed elements of planning, monitoring and checking outcomes. See Table 14 for an outline of the criteria derived from Brown and Palincsar (1982).

Table 14

Criteria for "Knowledge Of" and "Regulatory" Labels Assigned to Interview Statements

Label	Criteria from Brown and Palincsar (1982)
Knowledge of	Conscious access to one's own cognitive operations Reflection about the cognitive operations of others
Regulatory	Planning - prior - Predicting outcomes - Scheduling strategies - Using forms of vicarious trial and error Monitoring - during - Monitoring - Testing - Revising - Rescheduling Checking outcomes - Evaluate efficiency and effectiveness

Notations were also made when the subject seemed at a loss as to what to do or used a statement reflective of lack of knowledge as to how he learned or how he could regulate his learning. Examples of such behaviours can be seen when the subject reports being totally helpless in a relatively straightforward situation and can progress only by turning the problem over to another.

Step Seven:

Following the same procedures used in Step Six, transcripts and themes were interrogated to see if "knowledge of" statements gave general or specific information.

Interview Theme 19 (Subject C)

Uses the encyclopedia if asked to write a paper
[knowledge of (general)]

Interview Theme 24 (Subject D)

Types because his writing is so poor but many marks are lost because of typographical errors
[knowledge of (specific)]

Step Eight:

The total number of themes falling into Specific "knowledge of," general "knowledge of" and "regulatory" were ranked and compared with the rankings of the same three groupings of themes labelled as spontaneous to see if the two were constant, similar or differing. For example:

		General	Specific	Regulatory
Subject A	Total	1	2	3
	Spontaneous	1	3	2
	(Differing)			
Subject C	Total	3	2	1
	Spontaneous	3	2	1
	(Constant)			

Step Nine:

Themes and transcripts of responses to Questions 3, 4, 6 and 7 were again examined to see if the subject's statements were spontaneous or if they were parrotings of or agreements with the examiner's statements.

The labeling of statements as "spontaneous" versus "prompted" is somewhat artificial as the majority of statements were not truly spontaneous but initiated by direct questioning. Statements were labelled "prompted" when the examiner offered a suggestion which was subsequently responded to with a yes, no or sometimes. For example, if the examiner said, "Do you talk out loud to yourself when you study?" and the subject said, "Yes," the theme *S. talks aloud when studying* was labelled as a prompted theme. Prompted labels were also ascribed to themes bearing information which the subject had merely parroted from the examiner's probes. If the subject expanded in any way on the examiner's words, his response was counted as spontaneous. For example, if the examiner said, "Have you ever tried taping?" and the subject responded, "Taping a class? I used to tape but I haven't taped this year at all," the theme has taped classes in the past but not presenty was labelled as a spontaneous theme.

Note: In labeling themes, content of the verbatim transcript was essential in separating "knowledge of" from "regulatory" statements as well as determining the degree of specificity reflected by the statement. Taken out of context, the themes did not always give sufficient information for labeling.

Step Ten:

Information gleaned from the Interview, data reduction and data interrogation formed the basis for information used to compile portions of individual case studies.

Note: Results of the Interview analysis may be found in Chapter V. Details of the analysis are found in Appendices W through Z.

Video Tape Analysis

Verbal reports form the raw data of much of the proposed research. In general, the following quotation about phenomenological studies can be applied to verbal protocol studies. "Phenomenology depends almost exclusively upon the power of language for communication and therefore description is its main technique" (Giorgi, 1975, p. 100). Since expressive language problems are common in learning disabled students (Johnson and Myklebust, 1967; Wiig and Semel, 1984; and Lerner, 1985), data collection which relies solely on transcriptions of the subject's verbalizations could be suspect. Other limitations of verbal protocol methods in general are described by Glass et al. (1979) and are outlined below:

1. Gaps exist where the subject forgets to talk as he goes along or where he seems to have "leaped" to a conclusion without mentioning how he got there.
2. Verbal protocol may be difficult with subjects other than highly verbal college students.
3. Nonverbal reasoning such as visual imagery may not be reported and as well some aspects of problem solving may not be conscious.
4. Being aware of observation, subjects may employ strategies other than those used under more "normal" conditions.

The use of video tapes provided supplementary information to help to fill in any gaps left by the verbalizations. While the nonverbal aspects of reasoning may not be viewed, nonverbal behaviour gave information regarding inspection, regulation and correction. As well, while a student did not say: "I planned my approach for ninety seconds," the video made such information easily attainable. Preciseness was also another benefit of the video recordings. It did occur that a subject, while deep in thought, said something to the effect: "No - not this one - this one." In most cases the examiner probed for additional information or provided a description and asked for confirmation; i.e., "You mean the plastic and not the wooden?" If such a probe was not possible because the subject very quickly entered into a verbal reasoning scenario the researcher did not wish to interrupt, the video provided the necessary supplementary information.

Contrasting the student's behaviour with his verbalizations was extremely important. Results of the pilot study showed clearly that although students could:

1. evaluate the researcher's performance by choosing the most efficient strategy demonstration from two or three demonstrations and correctly verbalize why their choice was best, and
2. answer metacognitive and procedural questions in a manner indicative of complete understanding of the task at hand,

these same students did not use the strategy they defined as best, in subsequent trials of the task.

Brown and Palincsar (1982) have said that there is "a sharp distinction made between conscious awareness and direction of thought and self-correction and regulation" (p. 2). Although this discrepancy between verbalization and action presents a further argument for use of video, it also speaks to the value of the way in which tasks were set up, providing opportunities for subjects to judge, verbalize and perform.

THE TRIAL-DEMONSTRATION-TRIAL FORMAT

If no attempt had been made to have subjects "try again" following an elicitation phase, it would have appeared that some subjects who did not use a specified strategy in the first trial had "the hang of it" after evaluating the examiner's demonstrations because of their ability to explain correctly how the task should be done. It was only in actually attempting the task again that it became apparent that what was verbalized and seemingly understood, did not translate into action.

SUMMARY OF ANALYSIS

Through the analysis of video-recorded behaviours and verbal protocol data, made while subjects were completing specific tasks and responding to interview and questionnaire items, examinations were made of:

- The students' abilities to use strategy spontaneously, to use strategy after evaluating demonstration (but not being given instruction), and the subjects' lack of strategy use.
- The subjects' abilities to plan, inspect, regulate, verify, correct and organize themselves in general in academic and less academic settings.
- The comparison of student and teacher opinion on strong and weak organizational skills in academic and less academic settings.
- The extent to which subjects' statements revealed a knowledge of their study habits and/or an awareness of how they regulated their learning.
- The degree to which knowledge of study habits was specific or general.
- The tendency of the subjects to give information spontaneously or to parrot, agree or disagree with the examiner's comments.

- The comparison of task behviour with underlying ability, academic, processing and language skill scores.
- The comparison between verbalized knowledge and the ability to demonstrate the knowledge concretely.

ARGUING FOR AN IN-DEPTH APPROACH

The aim of the present study was to observe and describe the task approach of adolescent learning disabled students. The tasks utilized provided opportunities for observation over a range of activities. Two of the tasks, the Rods Task and the Self-Ordered Task, resembled rather typical laboratory experiments; the Text Search Task was very close to what might be an ongoing classroom activity and the Errand Planning Task involved skills used in daily living. The tasks encompassed abilities important to "getting along" from day to day. An underlying precept of the study was that not only the students' knowledge, but their knowledge of their knowledge about such activities was important.

> . . . self interrogation concerning the current state of one's own knowledge during problem solving is an essential skill in a wide variety of situations, those of the laboratory, school or everyday life. (Brown, 1977, p. 6)

In choosing subjects for the study, the heterogeneity of the learning disabled population was recognized. In the present research, an attempt was made to study a subgroup: learning disabled adolescents with organizational difficulty. Also, extensive measures were utilized to gain information on underlying skills, further clarifying just who was being studied.

In the present study, students were defined by

- school system criteria
- accepted definition (National Advisory Committee, 1968)
- ability test profiles
- processing academic and language skill profiles
- organizational skills.

In this group, then, the rationally defined subgroup was made up of learning disabled adolescents with organizational problems. The measures of intelligence, achievement and processing incorporated in the design served to provide information which may lead to an eventual understanding of skill and ability patterns underlying organizational approaches and strategy use.

Although the extensiveness of the testing of the present study is more reminiscent of a clinical evaluation than a traditional research design, such detail may help to overcome one of the principal difficulties with studies in the field of learning disabilities.

> . . . general inadequate descriptions of the subject populations being designated as learning disabled make it extremely difficult to draw general conclusions from the L.D. literature with any degree of confidence (Kurland & Campione, 1982, p. 6)

The present study was an initial step. It is anticipated that it will help to lay the foundation for future hypotheses, theories and knowledge of organizational skill subgrouping. However, it must be remembered that, if poor organizers do have specific patterns of underlying skills, the results may not be immediately apparent.

> As is the case with cluster analysis, research using rationally defined subgroups is not likely to produce immediately reliable results. Only programmatic research extending over a period of years will provide a relatively stable picture of subgroup characteristics and knowledge of important variability within subgroups. (Torgeson, 1982b, p. 115)

"Instant" result studies have shown repeatedly that differences exist in the performance of inefficient and efficient learners. The present study acknowledges these differences and is an attempt to add depth to the understanding of some of the underlying reasons for these differences.

Such an in-depth study could not be carried out with a large group of students. There is good support in the literature for utilizing small groups and/or case study approaches. Simon and Simon (1978) used one novice and one experienced student in a study of problem-solving ability in physics. Goldin and Hayes-Roth (1980) used five subjects to study individual differences in planning. Giorgi (1975) analyzed the verbalizations of just one subject as she reflected on "what" and "how" she learned.

Through small, carefully defined groups and extensive qualitative analysis of the verbalizations and the task performance of the individuals of those groups, utilizing a case study approach, the proposed study should contribute to a more detailed understanding of the inefficient learner.

CHAPTER FIVE

RESULTS

SKILLS ASSESSMENT

Results of intellectual (see Table 2), achievement (see Table 6), processing (see Table 7) and language (see Table 8) assessments have been reported earlier. Subjects were ranked from 1 to 7 in terms of highest to lowest score on each measure given. Such ranking was straightforward for all test results but the subtest results from the *Detroit Tests of Learning Aptitude*. *WISC-R* and *WAIS-R* Full Scale, Performance and Verbal IQs; *Woodcock* and *WRAT* percentiles, and *CELF* and *Fullerton* raw scores were ranked easily. The *Detroit* scores, reported in age scores, were converted to discrepancy scores before they were ranked. Table 15 shows how discrepancy scores were calculated and rankings determined for the Verbal Absurdities subtest. Age discrepancy rankings for the Auditory Attention Span Subtests were devised in the same way and appear in Table 16. Summary rankings were determined for each subtest (see Tables 16, 17 and 18). Rankings of all subjects on skills measured appear in Table 19 and a summary of the number of skills ranked at each of the seven positions is found in Table 20.

When each ranked position was assigned a value: position 1(7); 2(6); 3(5); 4(4); 3(3); 6(2) and 7(1), and that value was multiplied by the number of times the subject had received a ranking at that level, it was possible to arrive at summative scores which in turn provided an overall ranking (see Table 21).

Table 15

Age Discrepancies and Rankings on the Verbal Absurdities Subtest of The Detroit Tests of Learning Aptitude

Subject	Chronological Age	Age Score on Detroit Verbal Absurdities	Discrepancy	Ranking
A	16y 1m	10y 6m	- 5y 7m	7
B	16y 5m	14y 3m	- 2y 2m	3
C	17y 0m	15y 0m	- 2y 0m	2
D	15y 4m	15y 6m	+ 2m	1
E	19y 1m	14y 0m	- 5y 1m	6
F	18y 10m	14y 0m	- 4y 10m	5
G	15y 11m	13y 0m	- 2y 11m	4

Abbreviations: y = years
m = months

Summary Rankings--Verbal Absurdities:

1	D
2	C
3	B
4	G
5	F
6	E
7	A

Organizational rankings were then compared with each of the fifteen measured skills as well as the composite score of those

Table 16

Age Discrepancies and Rankings on Auditory Attention Span Subtests of the Detroit Tests of Learning Aptitude

Subject	Chronological Age	*Age Score On Detroit Unrelated Words	Discrepancy	Ranking	Age Score On Detroit Related Syllables	Discrepancy	Ranking
A	16y 1m	8y 8m	7y 5m	3	8y 0m	8y 1m	6
B	16y 5m	8y 10m	7y 7m	4	9y 9m	6y 8m	2
C	17y 0m	7y 0m	10y 0m	6	10y 3m	6y 9m	3
D	15y 4m	8y 6m	6y 10m	2	10y 0m	5y 4m	1
E	19y 1m	10y 8m	8y 5m	5	13y 9m	5y 4m	1
F	18y 10m	8y 6m	10y 4m	7	12y 3m	6y 7m	4
G	15y 11m	9y 3m	6y 8m	1	8y 0m	7y 11m	5

*Average of simple and weighted score

Abbreviations: y: years
m: months

Table 17

Summary Rankings - Auditory Attention Span for Unrelated Words from the Detroit

Rank	Subject	Discrepancy
1	G	6y 8m
2	D	6y 10m
3	A	7y 5m
4	B	7y 7m
5	E	8y 8m
6	C	10y 0m
7	F	10y 4m

Abbreviations: y = years m = months

skills and the lowest academic mark. Figure 4 outlines these comparisons and also reveals in which comparisons subjects had equal

Table 18

Summary Rankings - Auditory Attention Span for Related Syllables from the Detroit

Rank	Subject	Discrepancy
1	D & E	5y 4m
2	F	6y 7m
3	B	6y 8m
4	C	6y 9m
5	G	7y 11m
6	A	8y 1m
7		

Abbreviations: y = years m = months

	WISC-R or WAIS-R						Woodcock						WRAT		CELF			
Rank	IQ	Org	VIQ	Org	PIQ	Org	WID	Org	WA	Org	PC	Org	Arith	Org	C_4	Org	C_{11}	Org
1	G	C	D	C	B	C	A	C	G	C	A	C	B	C	A	C	B	C
2	D	B	G	B	G	B	G	B	A	B	F,G	B	F	B	G	B	F	B
3	B	E	E	E	C,E	E	B	E	B	E	C	E	C	E	E	E	A	E
4	E	D	B	D	D	D	C	D	C	D	B	D	D	D	C	D	E	D
5	C	F	A,C	F	F	F	D	F	D	F	D	F	A	F	B	F	G	F
6	A	G	F	G	A	G	F	G	E	G	E	G	G	G	D	G	C	G
7	F	A		A		A	E	A	F	A		A	E	A	F	A	D	A
Equal:	0		1		3		0		0		0		2		1		0	
1 Up or Down:	3		1		2		3		2		0		1		0		3	
Total:	3		2		5		3		2		1		3		1		3	

	Detroit						Fullerton						Lowest Academic Mark		Composite Skill	
Rank	VA	Org	UnW	Org	RelSyl	Org	F_5	Org	F_6	Org	F_7	Org	LM	Org	CS	Org
1	D	C	G	C	D,E	C	B	C	A,B,C	C	B,C,E	C	D	C	B	C
2	C	B	D	B	B	B	D	B	E,F	B	A,G	B	E	B	A	B
3	B	E	A	E	C	E	G	E	D	E	D	E	B	E	C	E
4	G	D	B	D	F	D	F	D	G	D	F	D	C	D	D	D
5	E	F	E	F	G	F	E	F		F		F	G	F	G	F
6	A	G	C	G	A	G	C	G		G		G	F	G	F	G
7	F	A	F	A		A	A	A		A		A	A	A	E	A
Equal:	0		0		1		1		1		1		1		1	
1 Up or Down:	3		0		3		2		3		3		4		3	
Total:	3		0		4		3		4		4		5		4	

Abbreviations:
Org: Organizational Skills
IQ: Intelligence Quotient
VIQ: Verbal Intelligence Quotient
PIQ: Performance Intelligence Quotient
WID: Word Identification Subtest
WA: Word Attack Subtest
PC: Passage Comprehension Subtest
Arith: Arithmetic Subtests
VA: Verbal Absurdities Subtest
UnW: Auditory Attention Span for Unrelated Words Subtest
RelSyl: Auditory Attention Span for Related Syllables Subtest
C_4: Processing Relationships and Ambiguities
C_{11}: Producing Formulated Sentences
F_5: Divergent Production
F_6: Syllabication
F_7: Grammatic Competency
LM: Lowest Mark
CS: Composite Skill

Figure 4: Comparisons of measured skill level rankings and organizational rankings to show equal and similar rankings.

Table 19

Rankings of all Subjects on Skill Measures

		WISC-R WAIS-R			Woodcock %iles			WRAT %ile	Detroit Discrepancies			CELF (RS)		Fullerton (RS)		
Rank	CA	FSIQ	VIQ	PIQ	WID	WA	PC	Math	VA	UnW	RelSyl	C_4	C_{11}	F_5	F_6	F_7
1	E	G	D	B	A	G	A	B	D	G	D & E	A	B	B	A B C	B C E
2	F	D	G	G	G	A	F G	F	C	D	B	G	F	D	E F	A G
3	C	B	E	C E	B	B	C	C	B	A	C	E	A	G	D	D
4	B	E	B	D	C	C	B	D	G	B	F	C	E	F	G	F
5	A	C	A C	F	D	D	D	A	E	E	G	B	G	E		
6	G	A	F	A	F	E	E	G	A	C	A	D	C	C		
7	D	F			E	F		E	F	F		F	D	A		

Abbreviations:
CA: Chronological Age
FSIQ: Full Scale Intelligence Quotient
VIQ: Verbal Intelligence Quotient
PIQ: Performance Intelligence Quotient
Woodcock: Woodcock Reading Mastery Tests
%iles: Percentiles
WID: Word Identification
WA: Word Attack
PC: Passage Comprehension
WRAT: Wide Range Achievement Test
Detroit: Detroit Tests of Learning Aptitude

VA: Verbal Absurdities
UnW Unrelated Words (Auditory Attention Span for)
RelSyl: Related Syllables (Auditory Attention Span for)
CELF: Clinical Evaluation of Language Function
RS: Raw Scores
C_4: Processing Relationships and Ambiguities
C_{11}: Producing Formulated Sentences
Fullerton: Fullerton Test of Adolescent Language
F_5: Divergent Production
F_6: Syllabication
F_7: Grammatic Competency

or similar rankings. Only rankings which were equal and those one higher or one lower were compared. For example, in comparing the Arithmetic subtest of the WRAT rankings to organizational skill rankings, Subjects D and G were ranked equally at fourth and sixth positions while Subject B was ranked first in Arithmetic and second in organizational skills. Thus in the comparison of Arithmetic and Organizational skills, three subjects, Subjects D, G and B were said to have achieved equal or similar rankings.

Eleven of the seventeen comparisons showed a total of three or fewer subjects with equal or similar rankings while the remaining six

Table 20

Number of Skills Ranked at Each of the Seven Ranked Positions

	Rankings							Total of Ranked Positions	
Subject	1	2	3	4	5	6	7	1 to 3	5 to 7
A	④	2	2	0	1	2	1	8	4
B	⑤	1	3	2	1	0	0	9	1
C	2	1	3	③	③	0	0	6	3
D	2	2	2	0	③	1	1	6	5
E	②	1	1	1	②	②	②	4	6
F	0	④	0	3	0	1	④	4	5
G	1	④	1	2	2	1	0	6	3

Note: Circled scores are the highest for that subject

Example: Subject A had 4 skills which were ranked number 1.

comparisons revealed four or more subjects with equal or similar rankings. The highest total number of possible equal or similar rankings for each comparison was seven. Table 22 shows the frequency of equal or similar rankings between each skill measured; composite skill scores; the subject's lowest academic mark and organizational skill rankings.

Five of the seven subjects obtained equal or similar rankings on organizational skills and their measured Performance IQs as well as organizational skills and their lowest academic mark. Using this method, a trend seemed to establish itself in that subjects with

Table 21

Summary Composite Rankings on all Skills Measured

Subject	Rank times Value times Frequency Score 1(7)	2(6)	3(5)	4(4)	5(3)	6(2)	5(1)	Total Score	Ranking
A	28	12	10	0	3	4	1	58	2
B	35	6	15	8	3	0	0	67	1
C	14	6	15	12	9	0	0	56	3
D	14	12	10	0	9	2	1	48	4
E	14	6	5	4	6	4	2	41	7
F	0	24	0	12	0	2	4	42	6
G	7	24	5	8	6	2	0	52	5

Note: Number of skills ranked at each level (see Table 20) have been multiplied by the value assigned to that ranking (i.e.) Subject A had 4 skills ranked in the number 1 position and as the number one position was assigned a value of 7 his Rank x Value x Frequency Score = 28.

Table 22

A Comparison of Rankings of Seventeen Measures and the Subjects' Organizational Skill Rankings

Number Subjects Attaining Equal or Similar Rankings	Number of Measures on Which Rankings are Obtained	Names of Measures
0	1	- Auditory Attention Span for Unrelated Words (Detroit)
1	3	- Verbal IQ (WISC-R or WAIS-R) - Passage Comprehension (Woodcock) - Processing Relationships and Ambiguities (CELF)
2	1	- Word Attack (Woodcock)
3	6	- Full Scale IQ (WISC-R WAIS-R) - Word Identification - Arithmetic (WRAT) - Verbal Absurdities (Detroit) - Producing Formulated Sentences (CELF) - Divergent Production (Fullerton
4	4	- Auditory Attention Span for Related Syllables (Detroit) - Syllabication (Fullerton) - Grammatic Competency (Fullerton) - Composite Skills Score
5	2	- Performance IQ (WISC-R or WAIS-R) - Lowest Academic Mark

Interpretation of Table: Example: No subjects obtained equal or similar rankings on one measure--Auditory Attention Span for Unrelated Words.

lower Performance IQs tended to have been rated as having lower organizational skills by their teachers, while those with higher Performance IQs were rated as possessing higher organizational skills by their teachers. The same pattern held true when organizational skill rankings were compared with the rankings of the lowest academic mark achieved.

To attempt to validate this method of comparison, the subject's rankings on Full Scale, Performance and Verbal Intelligence Quotients were compared. Figure 5 outlines these comparisons. Seven of the seven subjects received equal or similar rankings on Full Scale and Verbal IQ score rankings; four of seven subjects received equal or similar rankings when Verbal and Performance IQ rankings were compared; and three subjects had equal or similar rankings when Full Scale and Performance IQ rankings were compared.

TASKS

Results of the Rods Task

Of the seven subjects, none used the control-of-variables strategy spontaneously in the first Free Performance Trial. The strategy could not be elicited from any of the subjects so that it could be demonstrated on the second Free Performance Trial. All subjects were therefore classified as Strategy Absent.

Subjects were encouraged to do several tests during a trial so that they were able to have the opportunity to investigate a variety of hypotheses about bending. The mean number of tests per trial for the First Trial was 7.9 (range 6 to 11) while for the Second Trial

Rank	Weschler Full Scale IQ	Weschler Verbal IQ	Weschler Full Scale IQ	Weschler Performance IQ
1	G	D	G	B
2	D	G	D	G
3	B	E	B	C,E
4	E	B	E	D
5	C	A,C	C	F
6	A	F	A	A
7	F		F	
Equal:	1		1	
1 Up or Down:	6		2	
Total	7		3	

Rank	Weschler Verbal IQ	Weschler Performance IQ
1	B	D
2	G	G
3	C,E	E
4	D	B
5	F	A,C
6	A	F
7		
Equal:	2	
1 Up or Down:	2	
Total:	4	

Abbreviation: IQ: Intelligence Quotient

Figure 5: **Comparison of Full Scale, Verbal and Performance IQ Rankings to show equal and similar rankings.**

the mean number of tests per trial was 5.6 (range 3 to 8).

Since the control-of-variables strategy was, for the purposes of the present study, said to be present if the subject tested four of the possible six variables by use of unconfounded tests and named each variable being tested, it was important to make a distinction beween the number of unconfounded tests employed and the number of variables tested by unconfounded tests. For example, a subject might have done three unconfounded tests--all for material. As he was testing only one variable by unconfounded means, his tests thereby contributed only one unconfounded test to the ratio of unconfounded tests to total number of variables. Table 23 shows the total number of unconfounded tests made by each subject on each of two trials but also shows the number of variables tested with unconfounded tests.

Two of the subjects, Subjects A and F, increased the proportion of variables tested through unconfounded tests on Trial Two over Trial One while three subjects, Subjects B, C and D, decreased that proportion. Subject E made no unconfounded choices and Subject G's proportion of confounded and unconfounded tests remained the same (see Table 24).

When asked to choose which would be the best pair of two pairs to test a particular variable, students were very accurate. Of five choices the mean accuracy score was 4 (range 3-5) (see Table 25).

The pairs selection was the first elicitation step in the Rods Task. Interestingly, the ability to distinguish a confounded test from an unconfounded test was not reflected in the subsequent free choice trial (see Table 26).

Table 23

The Number of Unconfounded Tests Compared with the Number of Variables Tested with Unconfounded Tests in the Rods Task

	Ratio of Number of Unconfounded Tests to Total Number of Tests per Trial		Ratio of Number of Variables Tested with Unconfounded Tests to Number of Tests Per Trial	
Subject	Trial One	Trial Two	Trial One	Trial Two
A	0/8	1/5	0/8	1/5
B	4/11	3/6	2/11	1/6
C	4/8	1/6	3/8	1/6
D	2/6	0/8	2/6	0/8
E	0/7	0/3	0/7	0/3
F	1/6	3/6	1/6	3/6
G	3/10	1/5	2/10	1/5

Table 24

Increase and Decrease in Number of Variables Tested by Unconfounded Tests from Trial One to Trial Two of the Rods Task

Subject	Trial One	Trial Two	Increase	Decrease
A	0/8	1/5	1/5	-
B	2/11	1/6	-	1/66
C	3/8	1/6	-	5/24
D	2/6	0/8	-	1/3
E	0/7	0/3	-	-
F	1/6	3/6	1/3	-
G	2/10	1/5	-	-

Note: In the first two columns, the numerator is the number of variables tested by unconfounded tests and the denominator is the total number of tests per trial.

After attempting a second Free Performance Trial, subjects were asked to judge whether a displayed pair was a good test of a specific

Table 25

Accuracy of Choosing the Best Test of a Variable in the Rods Task

Subject	No. of Choices	Correct Choices
A	5	4
B	5	4
C	5	5
D	5	3
E	5	4
F	5	3
G	5	5
$\bar{X}$	5	4

Table 26

Effect of Elicitation Procedure on Control-of-Variables Strategy

Subject	Control-of-Variables First Trial	Percentage of Accuracy on Pairs Choice	Control-of-Variables Second Trial
A	no	80%	no
B	no	80%	no
C	no	100%	no
D	no	60%	no
E	no	80%	no
F	no	60%	no
G	no	100%	no

variable. They were asked to give a Yes or No response and to explain the reason for their decisions. Once again students were very accurate, with no student making more than two errors (see Table 27).

Table 27

Accuracy of Identifying Good and Poor Tests of Specified Variables in the Rods Task

Subject	No. of Questions	No. of Correct Responses	No. of Errors	Independent Test
A	5	5	0	no
B	6	5	1	no
C	6	6	0	yes
D	5	4	1	no
E	5	5	0	yes
F	6	4	2	yes
G	7	6	1.	no
$\overline{X}$	5.7	5	.57	

Three of seven students were able to independently construct an unconfounded test of a variable of their choice while four were unable to do so. Once again the ability to judge the merits of a demonstration did not necessarily mean the student could apply his knowledge to the construction of an unconfounded test (see Table 27). A summary of the principal findings of the Rods Task can be found in Table 28.

Table 28

Summary of Rods Task Data

Subject	First Trial	Pairs Choice	Second Trial	Final Choice	Independent
A	0/8	4/5	1/5	5/5	incorrect
B	2/11	4/5	1/6	5/6	incorrect
C	3/8	5/5	1/6	6/6	correct
D	2/6	3/5	0/8	4/5	incorrect
E	0/7	4/5	0/3	5/5	correct
F	1/6	3/5	3/6	4/6	correct
G	2/10	5/5	1/5	6/7	incorrect

Note: Trials: numerator is number of variables tested by unconfounded tests; denominator is number of trials
Choices: numerator is choice showing understanding of control of variable principle; denominator is the number of trials

Following the Rods Task, students were asked to sum up those things which had mattered for bending. These answers were compared with their responses to the same questions asked prior to any experimentation. A summary of their replies is found in Table 29. A quantitative analysis is contained in Table 30.

Discussions of the Rods Task

While all subjects in the group were classified as strategy absent because they could not demonstrate the ability to hold all other variables constant while testing for four of the six variables

Table 29

Response Summary of Those "Things Which Matter for Bending" in the Rods Task

Subject	Initial Response	Final Response
A	length	length, thickness, substance base
B	thickness, flexibility, length, where you put weights	thickness, length, base, material
C	thickness, length	material, width, length, base
D	length, thickness, density, weights	materials, cores, length thickness, density
E	length, distance weight is from base	weight, length, thickness gravity, rod strength, security in base, mass, material
F	length	weight, length, base, material capability of the resistance
G	length	thickness, material, base, length

Table 30

Increase in Number of Identified Variables

Subject	Expected Response	Initial Response	Final Response	Increase
A	5	1	4	3
B	5	3(4)	4	1
C	5	2	4	2
D	5	3(4)	4(5)	1
E	5	2	4(8)	2
F	5	1	4(5)	3
G	5	1	4	3

Note: Unbracketed figures indicate a response which is one of the four expected.
Bracketed figures are total responses including expected and idiosyncratic responses,

sequentially, they all obviously learned more about what matters for bending by doing the Rods Task. Only two of the subjects could identify as many as three variables to begin with whereas all subjects could name four of the expected variables by the end of the experiment.

Metacognitive Aspects of the Rods Task

An attempt to investigate metacognitive elements of the experience was made by asking students to judge if they had learned anything about bending from their work and if they had changed their minds or gained information from the experimentation. Examples of their responses may be found in Appendix E. Students' answers to this question tended on the whole to be limited and concrete. Subjects were also asked to name the things that had mattered for bending, much as they had done before the first trial.

In expanding the examination of iteration of variable names in the Free Performance Trials, an interesting pattern develops (see Table 31). Five of the subjects talked about five or more of the six variables while working, even though none could recall more than four when asked what mattered for bending at the conclusion of the experiment.

The major increase in knowledge of the variables occurred through the first independent investigation, an increase from thirteen total mentionings in the Initial Response to thirty-two total in the First Free Performance Trial. The first elicitation phase, Pairs Choice, in which all variables except position of weight were mentioned by the examiner, did not produce a further increase in number of variables mentioned overall. Indeed, in the Second Free Performance Trial thirty total mentionings occurred, a drop of two. The second elicitation, Final Choice, again did not affect any increase in the total variables listed in the Final Response. Once again the total dropped two to twenty-eight.

Viewing this overall trend in light of individual subjects the same pattern is general but not consistent. Three subjects (B, C and E) mentioned the greatest number of variables in the First Free Performance Trial on the basis of their experimentation and before

Table 31

Identified Variables Across Phases of the Rods Task

Variable	Subject																												Totals				
	A				B				C				D				E				F				G				Total Overall	Total in Initial Response	Total in 1st Free Performance	Total in 2nd Free Performance	Total in Final Response
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4					
Material		✓	✓	✓		✓	✓	✓		✓	✓	✓		✓	✓	✓		✓	✓	✓		✓	✓	✓		✓	✓	✓	21	0	7	7	7
Length	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	28	7	7	7	7
Diameter			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓		✓	✓	✓		✓	✓	✓	22	3	6	6	7
Base				✓		✓		✓		✓		✓		✓	✓	✓						✓	✓	✓			✓	✓	13	0	4	3	6
Weight						✓	✓						✓	✓	✓					✓		✓	✓			✓	✓		10	1	4	4	1
Position of weight					✓	✓	✓			✓							✓	✓					✓			✓	✓		9	2	4	3	0
Total expected variables mentioned	1	2	3	④	3	⑥	5	4	2	⑤	3	4	3	⑤	⑤	4	2	④	2	④	1	5	⑥	4	1	5	⑥	4	103	13	32	30	28
Irrelevant	0	0	0	0	1	1	0	0	0	1	0	0	1	3	2	1	0	2	0	4	0	1	1	1	0	0	0	0					
Total variables mentioned	1	2	3	④	4	⑦	5	4	2	⑥	3	4	4	⑧	7	5	2	6	2	⑧	1	6	⑦	5	1	5	⑥	4					

Column 1: Initial Response (listing prior to experimentation)
2: First Free Performance Trial (prior to elicitation)
3: Second Free Performance Trial (following first elicitation)
4: Final Response (listing following second elicitation)

Circled figures are the highest number of variables named.

elicitation was done. They did not mention as high a number of variables again during the experiment. Elicitation phases did not cause an increase in the number of variables named for these subjects; indeed the number dropped in subsequent activities (see Table 31). A fourth subject (Subject D) also mentioned the greatest number of variables in his first Free Performance, mentioning the same number after elicitation in the Second Free Performance Trial. Thus four of the seven subjects did not verbalize more variables after elicitation. Two subjects (Subjects F and G) also increased markedly the number of variables mentioned between the Initial Response (1 variable) and the First Free Performance Trial (5 variables) but each mentioned one more variable or all the variables in the Second Free Performance Trial following the first elicitation (Free Choice). It would seem then, for six of the subjects, that the self-directed manipulation with the rods was most instrumental in drawing out verbalizations regarding the variables. Trying to list variables at the conclusion of the experiment showed fairly good recall by all but one subject who named two less variables than he had in the First Free Performance Trial. Others named just one less, the same number or two more variables than they had in their first experiment.

One subject, Subject A, had a much different pattern from the others. He mentioned one more variable at each phase (see Table 31), listing more variables in the Final Response than at any other phase of the experiment.

Results of the Text Search Task

Of the seven subjects, three used the most efficient strategy spontaneously (utilizing the index). Other subjects were able to locate the correct answer but did so by using the table of contents to find the chapter and then by flipping through the pages looking at pictures, reading headings and skimming until the answer was eventually found. The remaining subject, while able to use the table of contents, did so inefficiently and afterwards could only page unsuccessfully through the book. Table 32 summarizes the use and effectiveness of strategies by the subjects.

Five of the seven subjects were able to pick the most efficient

Table 32

Success, Efficiency and Type of Strategy Used on Trial One of the Text Search Task

Subject	Successful	Efficiency Rating	Type of Strategy
A	no	n/a	2
B	yes	fair	2
C	yes	fair	2
D	yes	good	3
E	yes	fair	2
F	yes	good	3
G	yes	good	3

Efficiency rating code: type
1 (successful): poor (random flipping)
2 (successful): fair (table of contents used)
3 (successful): good (index used)

Note: Unsuccessful types were not rated.

of the three approaches to the text during both demonstrations (see Table 32). One subject chose a different strategy in each demonstraton. In Demonstration One, Subject B rejected the type 3 strategy because he misunderstood the dual role of the index/glossary, viewing it as a glossary. Although the examiner had referred to the index/glossary using the label "index", and had utilized it as such, the subject said, "...there's no sense in looking through the glossary unless you want to find definitions of words that you don't understand too well." Subject D was not given the opportunity to judge a second demonstration and thus selected no strategy.

Subjects were asked to explain the reason behind their choice during the elicitation phase. Their explanations may be found in Appendix P.

Despite the subjects' ability to judge the most efficient strategy during demonstrations, only one student, Subject C, could be said to use an elicited type 3 strategy in the second trial. Another subject, Subject B, used a type 3 approach but only when he was unsuccessful with a type 2 approach. Three other students, Students D, F and G, had used a type 3 strategy spontaneously in Trial 1 and employed the same method in Trial 2 (see Table 33).

Using a type 3 strategy as the preferred strategy, the students' task performance was classified as "spontaneous" if a type 3 strategy was used in Trial One; "elicited" if used in Trial Two but not Trial One; and "absent" if not used in either trial (see Table 33).

In summary, only three of seven students finding the answer to a

Table 33

Summary of Text Search Task

Subject	Trial One Used	Classification	Demo/ Selected	Demo/ Selected	Trial Two Used	Classification
A	type 2	absent	type 3	type 3	type 2	absent
B	type 2	absent	type 2	type 3	type 2/3	°elicited
C	type 2	absent	type 3	type 3	type 3	elicited
D	*type 3	spontaneous	type 3	not done	*type 3	spontaneous
E	type 2	absent	type 3	type 3	type 2	absent
F	*type 3	spontaneous	type 3	type 3	*type 3	spontaneous
G	*type 3	spontaneous	type 3	type 3	*type 3	spontaneous

°qualified

Efficiency rating code:
type 1 (random flipping)
type 2 (table of contents used)
type 3 (index used with table of contents)
*type 3 (index used without table of contents)

simple question by using a text of appropriate readablity used the index in locating their responses on an initial trial. However, whether using efficient or inefficient strategies, six subjects found the appropriate answer. A seventh student, despite having good reading skills, was unable to use the text to find the answer. Although they were able to judge which was the best of three approaches to using a textbook to gain information, three of the subjects were still unable to demonstrate this skill when asked to find information on a subsequent independent trial or Trial Two (see Table 33).

A more detailed analysis of the subjects' approach to their task can be found in Table 34. Only those subjects who used a type 2 strategy are described.

Table 34

Individual Approaches to Type Two Strategy Used in Trial One of the Text Search Task

Subject	Uses Table of Contents	Chooses Appropriate Title From Table of Contents	Flips Pages	Skim Read	Utilizes Pictures	Reads Aloud
A	yes	no	yes	yes	yes	no
B	yes	yes	yes	yes	yes	yes
C	yes	yes	yes	no	yes	yes
E	yes	yes	yes	yes	yes	yes

Discussion and Metacognitive Aspects of the Text Search Task

Metacognitive Question 1 asked students what a good way of using a text would be, while Metacognitive Question 4 required them to tell what they had learned from doing the task. For the most part the answers corresponded (see Table 35). Subject C and G's responses to the two questions varied somewhat but their words reflected their actions. For example, Subject G mentioned the index as the best way of using a text in answering Metacognitive Question 1 but said that he learned to use the table of contents in answering Metacognitive Question 4. The discrepancy was descriptive and accurate when viewed in terms of what Subject G did. He used the index only and could not see any advantage in utilizing the table of contents; however, he knew that he had learned about the use of the table of contents as part of the type 3 strategies employed by the examiner in her demonstrations and thus he verbalized that learning. Subject C described using both the table of contents and the index when he outlined a good method of using a text to find information. As he had used only the table of contents on his own, in Trial 1, he accurately reported learning about the index by doing the task when he answered Metacognitive Question 4.

Responses to Question 4 were compared to what the subjects had done in the second trial. The responses were termed "knowledge of what had been learned" and "regulation of action dependent on knowledge." In short, the investigation looked at whether or not the subjects had employed what they said they had learned. Table 36 provides summary statements on these aspects of the present study

Table 35

Evaluation of Text Search Efficiency--Metacognition Questions 1 and 4

Subject	Question 1: Good way of using text	Question 4: Thing learned by doing task
A	look in glossary	I don't know - that it's easier to find things that you want in the glossary than in the contents.
B	not asked	That you can - well when you can look through - if the index or glossary - if the index is in the back with the glossary - that some indexes are with the glossary - I didn't know that - (Examiner agrees) O.K. that's - that - if you want to find the place - you look in the index well, the glossary instead of just lookin' for the chapter and flippin' through to find out the right page. (This subject added that he would first flip through and then use the index).
C	Ah, look in the table of contents and find a heading that is very close to what you are looking for and look in the glossary and find out if there's a couple of places specifically for the heading you want and then turn to that page and get your information.	Yeah, I didn't realize you could use the index, I didn't think of that.
E	Look at the back just to see what your topic is.	Yeah, you can use the back to find out - the index - to find about where things in the chapters instead of flipping through.

(table continues)

Subject	Question 1: Good way of using text	Question 4: Thing learned by doing task
	Subject D was not questioned.	
F	Look for the index and the glossary (meant table of contents)	That you should use the index and you should try to find the chapter before you go to the index.
G	Well, you just flip to the index - look it up and if it says - like Earth or something' then you'll look under gravity and stuff and then you'll find it and you'll look at the page and then you'll turn the page	Yeah, that you should look in the table of contents - in school they always tell you that it is going to be in the book so - (Examiner asks when he would use the table of contents). If you were lookin' up a - if you were in school and you went to the library and you were lookin' for something on whatever - whatever - the sun..

while Table 37 outlines the results in chart form. All subjects but Subject F appeared to know what they had learned. In addition to what he had learned by doing the task, Subject F reported that he had learned something which he had actually known at the outset of the experiment; namely, use of the index. Three of the subjects (Subjects A, E and G) did not regulate their actions by their knowledge. Subjects A and E said that they had learned the value of the index but did not use it, while Subject G said he had learned how to utilize the table of contents but did not do so when the opportunity arose. As Subject D was not given the opportunity to respond to Question 4, use of the Regulation column in Table 38 for him was somewhat suspect. However, he certainly did not change his

Table 36

A Summary Comparison--Subjects' Knowledge of What They Had Learned and The Ability to Regulate Their Actions on the Basis of Their Knowledge on the Text Search Task

Subject A:	Absent. Said he had learned something which he did not demonstrate. Seemed to know what he had learned but did not regulate his actions accordingly. Recognized best in 2 of 2 demonstrations but could not do.
Subject B:	Elicited (qualified). Said he had learned something which he did not employ as first choice. Seemed to know what he had learned but was hesitant to regulate his actions accordingly. Recognized 1 of 2 demonstrations.
Subject C:	Elicited. Knew what he had learned. Regulated his actions according to his knowledge. Recognized best in 2 of 2 demonstrations. Could do.
Subject D:	Spontaneous. Recognized 1 of 1.
Subject E:	Absent. Said he learned something but never demonstrated. Seemed to know what he had learned but did not regulate his actions accordingly. Recognized best in 2 of 2 demonstrations but could not do.
Subject F:	Spontaneous. Said he learned something which he was already using before the trial. Also knew that he had learned about the table of contents--so he did not know what he had learned. Regulated his actions according to his knowledge Recognized best in 2 of 2 demonstrations and could do.
Subject G:	Spontaneous. Knew what he had learned. Regulated his actions on the basis of his knowledge but did not employ new found knowledge. Recognized best in 2 of 2 demonstrations but could not do.

approach or regulate his action to conform with what he had identified as best during the demonstration. He persisted in use of the index without the table of contents. Indeed, as Table 38 shows, the same patterns form when comparing the "Type of Strategy Chosen" to "Regulation" as is seen in comparing "Stated Knowledge" to "Regulation" (see Table 37).

Table 37

A Comparison of Subjects' Knowledge of What They Had Learned and Their Regulation of Action on the Text Search Task

Subject	Classification	Knowledge of What He Had Learned	Regulation of Action Dependent on Knowledge
A	Absent	Yes	No
B	Elicited (Qualified)	Yes	Only out of necessity
C	Elicited	Yes	Yes
D	* Spontaneous	Not asked	No
E	Absent	Yes	No
F	* Spontaneous	In Part	Yes
G	* Spontaneous	Yes	No

*modified Type 3 strategy (index only)

It should be noted that the classification of "Spontaneous" in relation to Subjects D, F and G was made on the basis of a modified use of a type 3 strategy. That is, they used the index directly without using the table of contents. While all three subjects chose the type 3 strategy, which utilized the table of contents and index, as the preferred method, only Subject F went on to utilize the table of contents in Trial 2, Subjects D and G stuck to the index-only method which they had first employed.

Table 38

A Comparison of Subjects' Choices of Demonstrated Strategies and Their Regulation of Action on the Text Search Task

		Type of Strategy Chosen		Regulation of Action Dependent on Demonstration Choices
Subject	Classification	Demo 1	Demo 2	
A	Absent	3	3	No
B	Elicited (Qualified)	2	3	Only out of Necessity
C	Elicited	3	3	Yes
D	* Spontaneous	3	-	No
E	Absent	3	3	No
F	* Spontaneous	3	3	Yes
G	* Spontaneous	3	3	No

*modified Type 3 strategy (index only)

In summarizing the basic information given in the four metacognitive questions used following the Text Search Task, it may be seen that all subjects identified use of the index as the preferred method of finding something in a textbook. All but Subject F recognized the similarities and differences in the strategies they used between Trial One and Two. Subject F said his methods were the same when he had actually utilized the table of contents in Trial 2 and had not done so in Trial 1. Subject A's response is not representative of the same comparisons other subjects made. That is, as mentioned earlier, he used a type 2 strategy for both Trials 1 and 2 and only used the type 3 strategy on the second trial when further intervention probes were given by the examiner.

While none of the explanations was as thorough as might have been expected, all subjects were able to verbalize reasons as to why one method was better than another or as to why their method was best. All subjects recognized that they had learned something, although Subject B only just acknowledged this by saying "slightly." In stating what they had learned, all subjects with the exception of Subject G mentioned the index. It was appropriate for Subject G not to have mentioned learning to use the index because he was a spontaneous user of a modified type 3 strategy. Subject B's response was interesting because, although he recognized the type 3 strategy as preferential and said its use was what he had learned, he stated categorically that he would still "flip through anyway."

Transsituational Approach

Knowledge of Task Principles

In comparing the Subjects' knowledge of what they had learned with subsequent regulation on both the Rods Task and the Text Search Task, some interesting similarities are evident. Subject F had the most errors in judging whether a particular set of rods was a good test of a specific variable, and also could not easily state what he had learned on the Text Search Task (see Table 39). All other subjects exercised good judgement in choosing unconfounded tests and in accurately telling what they had learned by doing the Text Search Task. (It should be noted that Subject D was not asked what he had learned from the Text Search Task.)

While it is clear that the task stage elements are not identical

Table 39

Transsituational Similarities in Knowledge of Task and Regulation of Behaviour

	Knowledge of Task		Regulation of Behaviour	
Subject	Rods	Text Search	Rods	Text Search
A	Yes	Yes	No	No
B	* Yes	Yes	No	Yes (out of necessity)
C	Yes	Yes	Yes	Yes
D	Yes	n/a	No	No
E	Yes	Yes	Yes	No
F	Lowest Score	In Part	Yes	Yes
G	Yes	Yes	No	No

*very convoluted responses

from task to task, they both reflect the students' knowledge of the task. In the Rods Task, the examiner placed two rods in the stand and said, "Could you use these Rods to tell for sure if _____ makes a difference for bending? Why or why not?" The subject had to understand the concept of confounded and unconfounded variables to make a decision and explain his reasons. In the Text Search Task the subject had to verbalize understanding of what constituted the most efficient approach. In both tasks, verbalizations reflected understanding.

Regulating Task Approach

Looking across tasks at the Rods and Text Search Tasks, the performance of individual students was again very similar (see Table 39). When asked to construct an independent test in the Rods Task, not all subjects were successful. Three of these, Subjects A, D and G were the same subjects who did not employ the most efficient strategy on the Text Search Task (see Table 39). Two other subjects, Subjects B and E showed an ability to regulate behaviour in one situation but not another.

Of interest here are the comparisons of knowledge of task versus regulatory behaviour on both tasks. Discrepancies in the ability to regulate on the basis of knowledge are of great import to the present study. Despite their knowledge of the task as reflected in their words, three of the subjects (Subjects A, D and G) could not do the task when handed the materials. In short, they could explain the tasks and the conceptualizations behind the tasks but they could not perform the tasks.

Results of the Errand Planning Task

The Errand Planning Task was analyzed by comparing quantitative factors of movement, time and errands. Three attempts were considered: the initial trial; a second run at the planning, immediately following the first trial; and the third trial which followed an attempt to elicit strategy. In the elicitations, the subjects' abilities to choose efficient rather than inefficient scenarios were examined.

In the following discussion of the Errand Planning Task, the terms spontaneous and elicited are used in connection with the manner in which subjects approached various tasks (see Table 40). In this case "spontaneous" takes on a somewhat different connotation than in the previous tasks. There is, included in the directive preceding the Errand Planning Task, a request to "decide, which of the errands you will do, the times you will do them, and how you will get around--will you walk or take a bus, for example?" With this instruction the examiner was giving parameters of a nature which were not included in the other tasks of the present study prior to the first Free Performance Trials.

As well "spontaneous" and "elicited", as used in the Rods and Text Search Tasks, referred to the implementation of a strategy while manipulating materials. The terms "spontaneous" and "elicited" in the Errand Task refer to the use of specific verbalizations made by subjects as they manipulated materials.

Table 40

Possible Spontaneous, Elicited and Minimal Use of Movement, Time and Errand References on the Errand Planning Task

	References		
Subject	Specific Movement	Time	Errand
A	Minimal	Minimal	Minimal
B	Spontaneous (declining)	Elicited	Spontaneous
C	Spontaneous	Elicited	Spontaneous
D	* Elicited (increasing)	Spontaneous	Spontaneous
E	Spontaneous (declining)	* Elicited (increasing)	Spontaneous
F	Spontaneous (declining)	Spontaneous	* Spontaneous
G	Spontaneous	Minimal	Spontaneous

*Redoing seemed to elicit better performance.

In addition, there were actual decreases in the numbers of references from the first to the third trial in movement references, making it hard to give solid labels of "spontaneous user" to subjects who did not seem to be consistent in the references over trials. Table 41 shows the mean reference total for specific movement, total movement, time, and errand references. Time is the most clearly increasing reference in these mean scores, with movement and errand means much less unidirectional. A subject-by-subject analysis will follow.

Table 41

Mean Number of References Made of Specific Movement, Total Movement, Time and Errands in Doing the Errand Task

Trial	Specific Movement	Total Movement	Time	Errands
1	11.28	16.71	5.71	10
2	9.8	15	6.83	12
3	10.29	12.57	9	10

Movement References

In the Errand Planning Task, movement references were expected because of the directive to tell "how you will get around, will you walk or take the bus for example." Terminology such as "walk" or "take the bus" when used was considered to be a specific movement reference, while use of "go" or "come" was considered to be a general movement reference. Through elicitation, it was hoped that the subjects would increase specific movement references if they had not used such references spontaneously. In comparing performances from the first to the third trial (see Table 42), two of the seven subjects (Subjects C and D) increased their use of specific movement references, while four subjects (Subjects A, B, E and F) decreased their levels of specificity in movement references. One subject,

Table 42

Use of Total and Specific Movement References in the Errand Planning Task

	Trial			Number of Movement References Trials 1 to 3	Number of Specific Movement References Trials 1 to 3
Subject	One	Two	Three		
A	6/6	n/a	4/5	Decrease	Decrease
B	19/15	7/10	11/13	Decrease	Decrease
C	12/17	10/14	13/15	Decrease	Increase
D	5/9	7/12	8/13	Increase	Increase
E	14/17	10/14	7/12	Decrease	Decrease
F	11/22	15/25	7/12	Decrease	Decrease
G	12/21	10/15	12/18	Decrease	Same

Numerator: Specific movement references

Denominator: Total number of movement references

Subject G, used the same number of specific movement references. Five of the subjects (Subjects B, C, E, F and G) appeared to use references readily in Trial One (see Table 42). In looking at what happened in subsequent trials for each of these subjects, however, much different patterns were revealed. These patterns created some concern in terms of using the labels "spontaneous" and "absent" as well as in determining just how elicitation took place.

First, the discussion will turn to how, in describing the initial references subjects made to specific movements, utilizing the term "spontaneous" became difficult. To establish some background, the reader must recall that there were 13 possible errands. Since the average number of references to the errands was 10 in the initial trial (see Table 41), an arbitrary number of eight specific movement references seemed a reasonable number of references to expect a subject to make. It amounted to somewhat less than one movement referent per errand. Using this criterion, Subjects B, C, E, F and G were classified as spontaneous (see Table 43). However, although Subjects B and E were considered spontaneous users of specific movement references in that they made 19 and 14 references respectively on trial one (see Table 43), by the third trial their references to specific movement had dropped by eight references for Subject B and by seven references for Subject E (see Table 44). Subject E's final number of references (7) to specific movement was just one point above Subject A's initial number of references (6) which were considered minimal.

Further, while Subject E showed a decrease from trial to trial, Subject B's references dropped in Trial Two by 12 and went up again by 4 in Trial Three (see Table 44), indicating that the demonstration could have prompted his reuse of the references but also showed lack of consistency in his use of specific movement references. No two of the performance scores of the five spontaneous users revealed a similar up/down pattern from trial to trial to trial (see Table 44). Subject F used 4 more references in Trial Two than on Trial One and then 8 fewer in Trial Three than Trial Two (see Table 44). Just redoing the task seemed helpful to Subject F. The demonstration did

Table 43

Numbers of Specific Movement and Total Movement References in Each Trial of the Errand Task

Subject		Trial One		Trial Two		Trial Three	
		Sp	Total	Sp	Total	Sp	Total
□ A		⑥	(6)	n/a	n/a	4	(5)
▽ B		⑲	(25)	7	(10)	11	(13)
° C		12	(17)	10	(14)	$\boxed{13}$	(15)
° D		5	(9)	7	(12)	$\boxed{8}$	(13)
▽ E		⑭	(17)	10	(14)	7	(12)
▽ F		11	(22)	$\underline{15}$	(25)	7	(12)
▽* G		12	(21)	10	(15)	12	(18)
	$\bar{X}$	11.3	16.7	9.8	15	10.3	12.6

Abbreviation: Sp = Specific

Note: Circled figures represent the highest number of references on Trial One.

Underlined figures represent the highest number of references on Trial Two. Could mean elicitation through repitition.

Squared figures represent the highest number of references on Trial Three. Could mean elicitation through demonstration.

*Subject G had two identical scores.

▽ Spontaneous Users
° Elicited Users
□ Minimal User

not elicit improvement. Subject G's references dropped in Trial Two and equalled those of the initial trial in Trial Three (see Table 43). Subject C showed only a very sight increase from Trial One to Trial Three and seemed to benefit both from redoing and observing the demonstration.

Table 44

Changes in Specific Movement References Over the Three Trials of the Errand Task

	Trials		
Subject	One to Two	Two to Three	One to Three
A	n/a	n/a	-2
* B	-12 down	+4 up	-8 down
C	- 2 down	+3 up	+1 up
D	+ 2 up	+1 up	+3 up
* E	- 4 down	-3 down	-7 down
F	+ 4 up	-8 down	-4 down
* G	- 2 down	+2 up	0

*Subjects who made the greatest number of references to specific movement in the first trial.

Subjects A and D, the only two subjects not termed spontaneous users, again had different patterns. Subject A made only minimal references and, since his references were below the arbitrary number of 8, he might therefore have been considered strategy absent. Subject A's specific movement references were certainly far below those of the other subjects, but in close keeping with the limited number of errand references he made. Subject D showed small consistent gains from trial to trial to trial but only just reached the figure of 8 references by the third trial. He, too, seemed to benefit from redoing the task as well as judging the demonstrations.

Should there have been no arbitrary quantitative performance set as criteria but, instead, if elicited had been defined as an increase in number of references, Subject C would become an elicited user, as his references showed a slight increase following the demonstration.

Time References

In the Errand Planning Task, time references were expected because of the directive to tell "the times you will do them" (the errands). If the same arbitrary criteria of "eight references for established use" is employed when viewing references to time while completing the errand task, a much different pattern emerges than was seen in looking at movement references (see Table 40).

Three of the subjects, Subjects B, C and E, show elicited use of time references (see Table 45), with Subjects B and C seeming to benefit more clearly from the demonstration and Subject E benefitting both from redoing the task and the demonstration (see Table 45). Subject D's and F's use of time references were termed spontaneous on the first trial because of the number of time references, 12 and 9 respectively. Both subjects showed increases in time references following redoing the first trial and a subsequent decrease in time references from Trial Two to Trial Three (see Table 46). Subjects A and G did not reach the arbitrary figure of 8 set as established use of time referents and so were said to have minimal use of time references (see Table 46).

Table 45

Changes in References to Time Over Three Trials of the Errand Planning Task

Subject	Trials One to Two	 Two to Three	 One to Three
A	n/a	n/a	$\underline{+4}$
▽ B	-6	+$\boxed{11}$	+5
▽ C	0	+$\boxed{3}$	+3
* D	+②	-1	+1
° E	+3	+2	$\underline{+5}$
* F	+②	-1	+1
▽ G	0	+$\boxed{4}$	+4

Note: Circled scores indicate the greatest increase in time references in simply redoing the task.

Squared scores indicate the greatest increase in time references between redoing the task and final trial. Demonstration may have elicited strategy.

Underlined score indicates the greatest increase in timed references between the first and final trial. As Subject A did no second trial, the contrast between redoing and the effect of the formal demonstration is not possible but, as with the squared scores, it may have been elicited in the demonstrations. Subject E seemed affected both by redoing and the demonstration.

Key:
- ▽ Elicited by demonstration
- * Elicited by redoing the task
- ° Affected by both redoing and demonstration

If the criteria for examination was set at simply showing an increase from trial to trial, then Subjects A and G could also be termed elicited users rather than minimal users of the time references.

Errand References

In the Errand Planning Task, errand references were expected because of the directive to "decide what errands you will do." All

Table 46

Number of Time References in Successive Trials of the Errand Planning Task

	Trial		
Subject	One	Two	Three
A	0	n/a	$\boxed{4}$
B	6	0	$\boxed{11}$
C	7	7	$\boxed{10}$
D	12	⑭	13
E	5	8	$\boxed{10}$
F	9	⑪	10
G	1	1	$\boxed{5}$
$\bar{X}$	5.7	6.8	9

Circled scores indicate the highest number of references on Trial Two. Squared scores indicate the highest number of references on Trial Three.

but one of the subjects appeared to use errand references spontaneously (see Table 40) using the criteria of 8 occurrences for established use. Table 47 shows that the spontaneous users included 8 to 12 references completed or done out of a possible 13, the first time they verbalized a plan. Subject A referred to doing only 4 errands on his first plan and did no more in his last plan. Subject F's pattern was less clear than other spontaneous users. He made 8 references to doing errands the first trial but increased his use to include all 13 on the second trial. It appeared that redoing the trial had in itself been very helpful to him. However, in the final trial his score dropped again to 8. With the exception of Subject F, the most variation which occurred between trials on errands reported as done was 2.

Total number of errand references mentioned were also compared from trial to trial for each subject (see Table 47). These included not only the errands which were reported done but those which were reported as rejected. In the first trial, three subjects (Subjects C, D and E) referred to an errand they did not do while in each of Trials Two and Three one subject (Subjects C and G respectively) made such a reference.

Table 48 shows the number of errands which were rejected, inferred or omitted by each subject on each of the three trials. An inferred trial was one in which the subject inferred that the errand was done but did not actually report doing it. For example, a subject saying that he went to the library would have inferred that he returned his books. Rejected errands gave interesting information about how a student priorized his errands. Rejecting a T.V. program gave a different sense to the plan than did rejecting studying for the upcoming exam.

Table 47

Number of Errand References and Errands Accomplished in Successive Trials of the Errand Planning Task

	Trial							
	One		Two		Three		Maximum Variation	
Subject	Ref	Done	Ref	Done	Ref	Done	Ref	Done
A	4	4	n/a	n/a	4	4	0	0
B	12	12	12	12	11	11	1	1
C	12	11	13	12	12	12	1	2
D	11	10	10	10	12	12	2	2
E	12	11	12	12	12	12	0	1
F	8	8	13	13	8	8	5	5
G	11	11	12	12	11	10	1	2
$\bar{X}$	10	9.6	12	11.8	10	10.1	1.4	1.9

Abbreviation: Ref = reference

Note: Errands done were specifically reported as done.

Errands referred were done or specifically verbally rejected.

Errands inferred or simply omitted are not included.

Table 48

Number of Errands Rejected, Inferred and Omitted on Successive Trials of the Errand Planning Task

	Trial								
	One			Two			Three		
Subject	Rej	Inf	Om	Rej	Inf	Om	Ref	Inf	Om
A	0	0	9	n/a	n/a	n/a	0	0	9
B	0	0	1	0	0	1	0	1	1
C	1	0	1	1	0	0	0	0	1
D	1	0	2	1	2	0	0	1	0
E	1	1	0	0	0	1	0	0	1
F	0	2	3	0	0	0	0	1	4
G	0	0	2	0	0	1	0	1	2
$\bar{X}$	.43	.43	2.6	.33	.33	.5	0	.57	2.6

Abbreviations:
Rej = Rejected
Inf = Inferred
Om = Omitted

Metacognition

Once they had completed the Errand Planning Task, students were asked the following questions:

1. Could you compare what you did in your first plan with what you did in your last plan? Tell me if you think that there was a difference. Which do you think was the better method? Why?

2. Did you learn anything about planning?
3. What makes a good plan?
4. What do you think about the planning which you did today?
   Did you make a good plan?

Detailed discussions of the metacognitive aspects of the Errand Planning Task can be found in the individual case studies developed on each subject. However, Table 49 contains a paraphrased summary of subjects' statements as they responded to these questions. These statements include answers to all of the questions asked but are not necessarily in a particular order. Table 50 gives direct quotations of the students' statements of what they had learned by doing the Errand Planning Task.

Asking students whether they had made a good plan brought all affirmative replies. However, in telling why they made good plans or in describing the differences in their two plans, none of the six questioned seemed to be fully aware of either what they had learned or what they had done from trial to trial. Subject A's reply that his plan was good because he could "get everything in order" was not in keeping with his actual plan in which only four of thirteen tasks were completed. Subject C saw his least efficient plan as his most efficient, giving as his reason that less backtracking was present. In actual fact, he backtracked more in the plan he thought was the better. Subject F had difficulty identifying the trial in which he accomplished the most errands, as did Subject G. Subjects B and E had the least marked problems in their awareness. They simply felt that they had made good plans because they had done all the errands.

While they came close, neither mentioned more than twelve errands on any one trial.

General Comments

The times from which the examiner finished instructions to the

Table 49

Summary of Metacognitive Statements Describing Aspects of Good Planning Following the Errand Planning Task

Subject	Important Aspects of Planning from all Four Questions
A	Thinking, getting everything in order.
B	Plan everything out, plan your route and destination, being on schedule, doing everything one is supposed to do.
C	Getting more done, using time efficiently, how much you can get done in a certain amount of time, thinking about what you're going to do, not just doing it.
D	Not done.
E	Combining errands, try two different plans and choose the best one, look at everything, get everything done.
F	Doing as much as one can, the time spent on it, doing most everything and going where you feel most needed, even out your time so you can meet appointments.
G	Think out the route you are going on, organize things and maybe even write them out, time yourself to see how much time it takes for each thing, think what would be the fastest, easiest and most important, timing and transportation are important.

Table 50

Quotations of What Was Learned From Doing the Errand Planning Task

Subject	Quotation
A	Planning is important.
B	Just plan everything out.
C	Think about what you're going to do and not just do it.
D	n/a
E	Got to look at everything.
F	Some things don't matter as much and you should even out your time a little better, like - spend so much time for that and this and make sure you got a plan - like - just don't go wherever you want - like, if you have to be somewhere - even out your time so you can be there by that time.
G	Organize things, maybe even write 'em out and then time yourself or something - measure how much time it would take if you - for each thing.

first beginnings of a verbalized plan was recorded (see Table 51). Subjects did not always continue along smoothly at that point; some restarted or asked further direction and those aspects were not timed. Subjects beginning to verbalize within one to three seconds were classified as immediate starts. Those taking longer than ten seconds had their behaviours classified in terms of one of three categories: seeking further guidance through questions; receiving further unsolicited guidance; or quiet examination of materials in a thoughful manner. Combinations of the previous categories were also identified when plans appeared to have strong elements of two categories.

Only three subjects (Subjects A, B and E) postponed beginning to verbalize their plans for longer than one minute and only one of those, Subject A, held off for more than two minutes. In examining

Table 51

Number of Seconds Spent Between End of Instructions and Commencing to Outline Daily Errands on the Errand Planning Task

	Task		
Subject	One	Two	Three
A	° 2 min. 19 sec.	n/a	11
B	☆ 1 min. 20 sec.	im	31
C	▽ 22 sec.	im	im
D	□ 32 sec.	im	20
E	▽ 1 min. 52 sec.	im	6
F	☆ 28 sec.	im	im
G	▽ 51 sec.	4	6

Abbreviations: im = immediate start (1-3 seconds)

° primarily composed of examiner supplying unrequested further guidance.

☆ primarily composed of student seeking and receiving further guidance.

▽ primarily composed of student examining materials quietly.

□ a mixture of unrequested further guidance and sought guidance.

Subject A's transcriptions, it was seen that the examiner kept trying to be helpful during that period by extending or repeating directives as Subject A seemed quite at a loss as to how to begin. Overall, the length of planning period did not seem to have any particular effect on the quantitative aspects of movement times and errands. Subject A's plan was idiosyncratic in all aspects. It was worth noting, however, that Subjects B and E, who had the third and second longest preplan periods respectively, verbalized somewhat less confusion as to their understandings of what they had done and learned in the Metacognitive investigation following the Errand Planning Task than did the other subjects.

Elicitation

With the exception of Subject A, subjects were able to select the most efficient scenario from the three demonstration pairs presented to them. Four of the students selected the correct plan immediately in three out of three pairs, while two students self-corrected an initial choice on one of the three demonstrations (see Table 52).

Scenarios used in the demonstration phase of the errands tasks may be found in Appendix H. Subject A, in demonstration 1, chose the first scenario. He seemed to fixate on the time it would take to walk home after dropping off the bike in the second scenario. He did not weigh the time or spatial factors involved. For example, he did not establish for himself that he would be spending over two hours just waiting for his dental appointment. Although he made the correct choice in demonstration 2, he again used the reasoning that the bus was faster than walking and did not seem aware of the other positive aspects of his choice such as clustering errands in space to save time. On the third demonstration, he gave no clear-cut reason for his choice and merely repeated the events. An overview of the acceptability of the subject's choices may be found in Table 53.

Table 52

Correct Choices on Demonstration Items--Errand Planning Task

Subject	Number of Demonstrations	Correct Choices
A	3	1
B	3	* 3
C	3	3
D	3	3
E	3	* 3
F	3	3
G	3	3

*one item self-corrected

Discussion of Errand Task

In summary, it may be said that all but one of the students showed increases in their ability to make time references and to include a wider range of time references from the first to last trial of the Errand Task. References to movement became more specific for

Table 53

Correctness of Choices and Reasons in the Demonstrations of the Errand Planning Task

Subject	Demo 1 Correct Choice	Demo 2 Correct Choice	Demo 3 Correct Choice
A	no	no	no
B	yes	yes	yes
C	yes	yes	yes
D	yes	yes	yes
E	yes	yes	yes
F	yes	yes	yes
G	yes	yes	yes

Abbreviation: Demo = Demonstration

three of the seven subjects. Errand references were made spontaneously by six of the seven subjects on the first trial. Four of the seven subjects showed slight increases in the number of errands done from the first to the third trial. The scores of Subject A were quantitatively much less than the other subjects on measures of movement, time and errands.

Table 40 shows that errand references were made in a spontaneous manner by six of the seven subjects, with five subjects spontaneously mentioning specific movement. It was clearly the time references which came less readily to the subjects, with spontaneous references being made by only two subjects.

Results of the Self-Ordered Task

Petrides and Milner (1982) report their results in terms of mean error scores in a bar graph format. As no precise mean or standard deviation scores were available, quantitative mean error scores were derived from reading the graphs provided in Petrides and Milner's (1982) work. They are, at best, crude estimates (see Table 54). Error scores of the subjects of the present study were then compared to the estimates of total mean errors for the experimental and control groups in the referenced study.

In viewing the data in terms of the total number of errors made by each subject on all four sets of the Self-Ordered Task as compared to the total mean error scores of the three Petrides and Milner (1982) groups, interesting patterns develop (see Table 55). Four of the seven subjects had scores exceeding the total mean errors of one or more of the normative groups. Two subjects, Subjects D and F, made 21 and 25 errors respectively, considerably higher than the normal group total mean error score of 8.9, the left frontal lobe total mean error score of 15.4, or the right frontal lobe total mean error score of 18.2. Subject E's total score exceeded that of the normal and left frontal lobe groups, while Subject A's total score was higher than the normal group only.

Performances on the individual trials of the Self-Ordered Task were timed. Mean times per set category and speed of performance ranking per set appear in Table 56. As a general rule of thumb, it

Table 54

Estimated Mean Error Scores from Petrides and Milner (1982) Study

	Set Categories				
Group	6	8	10	12	Totals
Normals	1.5/18	2/24	2.4/30	3/36	8.9/108
LFL	2.5/18	3.2/24	4.5/30	5.2/36	15.4/108
RFL	2.2/18	4.8/24	5/30	6.2/36	18.2/108

Note: Numerator is mean number of errors.
Denominator is total number of choices per set.

Abbreviations: LFL = Left Frontal Lobe
RFL = Right Frontal Lobe

Table 55

Individual Error Scores Compared to Mean Error Scores on Self-Ordered Task

Subject	Set Categories 6	8	10	12	Total	Rank
A	$\boxed{2}$	$\triangle 4$	1	$\boxed{4}$	$\boxed{11}$	3
B	0	0	1	1	2	1
C	1	$\boxed{3}$	1	0	5	2
D	$\boxed{2}$	⑤	⑤	⑨	㉑	5
E	0	⑤	⑤	$\boxed{5}$	$\triangle 15$	4
F	③	⑥	⑥	⑩	㉕	6
G	1	$\boxed{3}$	0	1	5	2

Note: Circled Scores = error score higher than or equal to mean error score of normals, left frontal lobe and right frontal lobe.

Boxed Scores = error score higher than mean error score of normal group but lower than frontal lobe scores.

Triangled Scores = error score higher than mean error score of normal group and left frontal lobe group.

Table 56

Average Times Per Set Category and Speed of Performance Ranking on Frontal Lobe Task

	Set Categories									
	6		8		10		12			
Subject	$\bar{X}$	(rank)	$\bar{X}$	(rank)	$\bar{X}$	(rank)	$\bar{X}$	(rank)	Total	(rank)
A	38.33	3	46.88	2	51.33	2	48.33	2	184.87	2
B	43.66	6	93.33	7	116	7	154.33	7	407.32	7
C	38.33	3	49	3	52	3	59.66	4	198.99	4
D	27.66	2	56	5	56.33	4	49.66	3	189.65	3
E	41.33	5	54	4	64.66	5	79.33	5	239.32	5
F	19.33	1	25	1	28.5	1	34	1	106.83	1
G	40.66	4	69.8	6	100.6	6	150.17	6	361.29	6

might be said that those who worked slowly did well while those who raced through the task did poorly. There was not a perfect relationship between increasing error count and increasing speed; however, Table 57 shows that in every case the subject with the greatest number of errors did the sets in the fastest time. In two of the four sets the subject with the slowest time had the least number of errors. In all sets, the second fewest number of errors was made in the second slowest or the slowest time for the set. The total error count combining the errors made in all sets showed the subject with the fastest time making the greatest number of errors (Subject F) and the subject with the slowest speed (Subject B) achieving the fewest errors. For most subjects, their ranking in terms of speed of performance remained fairly constant from set to set.

Since there was a strong visual memory component in the Self-Ordered Task, an attempt was made to compare the task with performance on the visual memory skills tapped by the Malcomesius and the Word Identification subtest of the Woodcock Reading Mastery Tests by comparing the subjects' rankings on the measures (see Table 58). All subjects had at least two identical rankings out of four ranked scores. Only two of the seven subjects had rankings which varied more than two points from measure to measure. The Self-Ordered Task error rankings were least like the other test rankings, with only three subjects having identical rankings in the Self-Ordered Task and one or two other visual memory tasks.

In Figure 6. Self-Ordered Task error rankings are compared with

Table 57

A Comparison of Number of Errors and Speed of Task Completion on the Self-Ordered Task

Subject	Errors On Set 6	Speed Ranking Set 6	Errors On Set 8	Speed Ranking Set 8	Errors On Set 10	Speed Ranking Set 10	Errors on Set 12	Speed Ranking Set 12	Total Errors	Overall Ranking
A	2	3	4	2	1	2	4	2	11	3
B	⓪	⑥	⓪	⑦	1	⑦	1	⑦	②	①
C	1	3	3	3	1	3	⓪	(4)	5	2
D	2	2	5	5	5	4	9	3	21	5
E	⓪	⑤	5	4	5	5	5	5	15	4
F	$\boxed{3}$	$\boxed{1}$	$\boxed{6}$	$\boxed{1}$	$\boxed{6}$	$\boxed{1}$	$\boxed{11}$	$\boxed{1}$	$\boxed{26}$	$\boxed{6}$
G	1	4	3	6	⓪	(6)	1	6	5	2

Circled scores: Lowest number of errors in error columns.
Longest time to do set in speed ranking columns.

Broken circle: Speed ranking of lowest number of errors when the ranking is not representative of the lowest number of errors.

Squared scores: Highest number of errors in error columns.
Shortest time to do a set in speed ranking columns.

each visual memory task ranking and the rankings of the visual memory task rankings are compared to one another. Rankings which are equal

Table 58

A Comparison of Rankings for Performance on Tasks with Visual Components

Subject	SOTE Ranking	WID(W) %ile Ranking	Total VME(M) Ranking	Total GL-FC(M) Ranking
A	3	1	②	②
B	1	③	③	5
C	2	④	④	④
D	⑤	⑤	⑤	3
E	4	⑦	6 (lowest ranking)	⑦
F	⑥ (lowest ranking)	⑥	4	⑥
G	②	②	①	①

Abbreviations:
SOTE = Self-Ordered Task Errors
WID(W) = Word Identification Woodcock
VME(M) = Visual Memory Errors (Malcomesius)
GL-FCE(M) = Glances - Far Copying (Malcomesius)
%ile = Percentile

Circled scores: Identical rankings for that subject

Squared letters: Subjects whose four rankings varied by no more than two places.

Rank	SOTE	WID	SOTE	VME	SOTE	FCE
1	B	A	B	G	B	G
2	C,G	G	C,G	A	C,G	A
3	A	B	A	B	A	D
4	E	C	E	C,F	E	C
5	D	D	D	D	D	B
6	F	F	F	E	F	F
7		E				E
Equal:	3		1		1	
1 Up or Down:	0		2		2	
Total:	3		3		3	

Rank	WID	VME	WID	FCE	VME	FCE
1	A	G	A	G	G	G
2	G	A	G	A	A	A
3	B	B	B	D	B	D
4	C	C,F	C	C	C,F	C
5	D	D	D	B	D	B
6	F	E	F	F	E	F
7	E		E	E		E
Equal:	3		3		3	
1 Up or Down:	3		2		1	
Total:	6		5		4	

Abbreviations:
SOTE: Self-Ordered Task Errors
WID: Word Identification
VME: Visual Memory Errors
FC: Far Copying

Figure 6: Comparisons of Self-Ordered Task Error rankings with Visual Memory Tasks and comparisons of Visual Memory Tasks with one another.

or similar are examined. In this case similar means that the ranking varied by only one position. It is clear that three subjects exhibited equal or similar rankings when the Self-Ordered Task rankings were compared with each of the other tasks. The incidence of equal or similar rankings increased, however, when the visual memory tasks were compared one with the other. Four of the seven subjects had equal or similar rankings when ranked errors from the Visual Memory subtests of the Malcomesius were compared to rankings of the number of glances in the Far Copying task from the same test. Five of the seven subjects had equal or similar rankings when percentile scores from the Word Identification subtest of the Woodcock were compared with the number of glances taken on the Far Copying Task. Six out of the seven subjects had equal or similar ranks on their Woodcock Word Identification percentile scores and the errors made on the Visual Memory subtest scores of the Malcomesius.

It should be stressed again that no attempt was made to ascribe frontal lobe damage or dysfunction through the use of the Self-Ordered Task. It was employed to see if subjects in the present study, who had some clinical characteristics similar to those of frontal lobe patients, would do poorly on a task which differentiated frontal lobe patients from normals. As the purpose of the twenty-point Questionnaire, presented to the teachers of the subjects used in the present study, was to delineate characteristics of disorganized behaviour and as the Questionnaire was based on an attempt to operationalize the descriptors of organized behaviour as Luria describes them in his discussions on frontal lobe function, the rankings of combined quantitative scores on the _Questionnaire on Organizational Skills_ were also compared with error rankings on the Self-Ordered Task (see Table 59). Five of the seven subjects had

Table 59

A Comparison of Subjects' Organizational Ability and Their Ability to Regulate Behaviour Across Tasks

Ranking	SOTE	Ability to Regulate	Total Org	Ability to Regulate
1	B	mixed	C	could
2	C G	could couldn't	B	mixed
3	A	couldn't	E	mixed
4	E	mixed	D	couldn't
5	D	couldn't	F	could
6	F	could	G	couldn't
7			A	couldn't

Abbreviations: SOTE = Self Ordered Task

Total Org = Teachers' Ratings of Organizational Ability

Note: Ability to regulate refers to performance on the final stages of the Rods and Text Search tasks.

similar rankings on the Questionnaire and on the Self-Ordered Task; that is, their rankings varied from one measure to the other by only one point.

There is no clear correspondence between those who did poorly on the Self-Ordered Task and those who could not regulate their task performance on the Rods and Text Search tasks (see Table 59). One of the three who formed the latter group (see Table 39), Subject D, ranked sixth on the Self-Ordered Task while Subjects A and G did well on the Self-Ordered Task, ranking third and second respectively.

There is somewhat better correspondence between the subjects whose combined teacher ratings on the Questionnaire on Organization Skills were low and those who showed an inability to regulate behaviour on the Rods and Text Search tasks (see Table 59). Subjects G and A could not regulate their behaviour on the tasks indicated and ranked sixth and seventh respectively on the Organizational Skills ratings. The other poor regulator, Subject D, ranked fourth in Organizational Ability as seen by his teachers.

Reporting on the numbers of times subjects successively touched one position while completing the Self-Ordered Task is not especially revealing (see Table 60). It was against the rules of the task to do so and subjects were reminded of what they were doing if they showed no inclination to stop by their own monitoring. There seemed to be no particular pattern of successive touchings with good or poor performance.

Looking at subjects' tendencies to touch the same picture successively as reported in Table 61, however, there is a trend at the extremes of the performance rankings. The subjects who were ranked 1 and 2 had no picture touched successively, and Subject F, who had the greatest number of errors on the Self-Ordered Task, had

Table 60

Number of Times One Position Was Successively Touched in Self-Ordered Task

Subject	Number of Successive Touches: 2X	3X	4X
A	3	2	1
B	10	0	0
C	7	0	0
D	12	2	1
E	7	4	0
F	10	2	0
G	8	0	0
Total	59	10	2

the highest recorded numbers of repeatedly touching the same picture. The picture was in different positions on the successive stimulus pages.

Table 61

Number of Times a Picture was Touched Twice Successively

Subject	Number of Pictures
A	3
B	0
C	0
D	3
E	3
F	7
G	2

QUESTIONNAIRE ON ORGANIZATIONAL SKILLS

Note: Procedural steps from Chapter IV: Methodology, are repeated here. (See Appendices A through V for analysis details.)

Procedure

The questionnaire used with students closely parallelled the initial screening questionnaire filled out by teachers and used to help identify the subjects as disorganized. Transcripts from the questionnaire were analyzed in a manner modelled after the work of Giorgi (1975), which suggests frameworks for data reduction and data interrogation of verbal protocols. The procedure followed is outlined below:

Step One:

All exchanges were transcribed verbatim.

Step Two:

The subjects' verbalizations were segmented into meaning units by examining the transcripts in an open manner with as little consideration of the aims of the study as possible.

Step Three:

All meaning units were restated as simply as possible as themes.

Step Four:

The twenty-one questions were grouped into the six skills which they were designed to tap. These skills were:

1. general organization (Questions 1, 7 and 13)
2. planning (Questions 2, 9, 14 and 19)

3. inspection (Questions 3, 8 and 15)
4. regulation (Questions 4, 10, 16 and 20)
5. verification (Questions 5, 11 and 17)
6. correction (Questions 6, 12 and 18)

Step Five:

Each subject's responses were summarized under the individual questions making up the skill, i.e.:

General Organization

Question #1: **Are you on time for class?**

Subject A: on time
B: usually 10 or 15 minutes late
C: on time
D: basically on time
E: hard to be on time in the morning
F: usually on time - sometimes late
G: on time except for first period in morning and after lunch

(See Appendix M for the remainder of the summaries.)

Step Six:

A second series of summary statements were constructed for each skill, by grouping the summary statements for the questions under each individual subject. For example, under the General Organization Skill each subject's name was followed by three descriptors for each of the three questions making up the skill, i.e.:

General Organization

Subject A: is on time
is tidy
has materials on hand

Note: These groupings were particularly useful in constructing the individual case studies. (See Appendix N for the remainder of the summaries.)

Step Seven:

The responses for each question were classified and then quantified. A table was constructed for each question (see Table 62 as an example).

Step Eight:

The information in the tables was discussed.

Step Nine:

A final summation on the skill was made.

Step Ten:

A procedure was devised whereby the examiner could rank subjects' responses and compare them to the relative rankings of their teachers on the Questionnaire on Organizational Skills. Transcripts and summary statements were consulted in this step. Answers to the twenty questions on the Questionnaire were first categorized as "Yes," "No" or "Sometimes" responses. "Yes" and "No" statements were those strongly affirmative or negative while all those answers of a less polar nature were labelled "Sometimes." Summary sheets for each subject including all twenty questions under the six organizational categories were developed. An example follows:

Subject G:

Planning

Question 2: Situation dependent
9: Yes
14: Yes
19: Affirmative response

Step Eleven:

Answers to the twenty questions of the *Questionnaire on Organizational Skills* were also examined to see if subjects gave some further information beyond an agreement or disagreement to the queries. Those answers with additional information were further labelled with the descriptor *example*.

The example descriptor was utilized if an example occurred somewhere in the interaction between the examiner and the subject, despite the number of probes required to draw out the example. To further examine the subjects' spontaneous knowledge, the examiner labelled all examples given following the initial question and prior to any further probes as *spontaneous example*. An example follows:

Subject G:

Planning

Question 2: Situation dependent (spontaneous example)
9: Yes (example)
14: Yes (spontaneous example)
19: Affirmative response (spontaneous example)

Step Twelve:

Quantification of the responses was achieved by assigning a "yes" or clearly affirmative response a 3; a "Sometimes" or situation dependent response a 2; and a "No" or clearly negative response a 1, i.e.:

Subject G:

Planning

Question 2:	Situation dependent (spontaneous example	2
9:	Yes (example)	3
14:	Yes (spontaneous example)	3
19:	Affirmative response (spontaneous example	3

Step Thirteen:

A further step of establishing ratio scores allowed the researcher to establish relative performances for each skill. For example, in Subject G's case as illustrated in Steps Ten, Eleven and Twelve, the highest score possible would have been 12, achieved from four "Yes" responses. Since Subject G had three "yes" responses and a situation specific response, he achieved a total of 11 points. The ratio established was then 11/12.

Step Fourteen:

Ratio scores were converted into decimal scores, which yielded figures which could be compared more easily. The individual's highest and lowest ratings from the six categories were then determined. An example follows:

Subject B:

General Organization:	.55	lowest
Planning:	.75	
Inspection:	.78	
Regulation:	.75	
Verification:	1.00	highest
Correction	.89	

Step Fifteen:

The rankings established in Step Thirteen were compared with the way teachers in academic and less academic settings had ranked the same subject, i.e.

	Highest Rating	Low Rating
Subject E:	Correction	Verification
Less Academic Setting:	Correction	Verification
Academic Setting:	General Organization	Regulation

Step Sixteen:

Transcripts were examined for preciseness. A series of descriptors was developed as follows:

1. A single word response. In general these were Yes/No/ Sometimes resonses which were labeled word. If the word gave other information such as "Lost," it was labeled Word - precise. Descriptive names of subjects such as "Social Studies" were also labelled word - precise.

2. A comment. Essentially those unitary ideas expressed in one phrase or single sentence statements were labeled comment. They were further described in the following way:

a. Precise comment: A comment which gave the reader a clear idea of a specific action or understanding and probably a sense that the subject was describing what he actually would do.

Questionnaire Meaning Unit (in part) #7 (Subject A)

Examiner: - Like, let's say it's a Math question and you've asked for help and you still don't know what to do - would you? What would you do?

Subject A: I'd just go on to another one. **[Comment (precise)]**

Examiner: Another question?

Subject A: Yeh. **[Word]**

Examiner: And leave it?

Subject A: Yeh. **[Word]**

b. General comment: A comment which gave only a general idea of an action or understanding and may, because of its generality, leave the reader less assured of having read a true reported action.

Questionnaire Meaning Unit #13 (Subject A)

Examiner: Do you do that sort of thing usually or would you only do that if you thought there was something wrong?

Subject A: I'd do it if I thought something was wrong. **[Comment (general) (parroting)]**

Examiner: But you wouldn't redo every question?

Subject A: No. **[Word]**

3. An elaboration. A descriptor of more than one sentence or phrase extending the unitary idea, usually by example.

a. Precise elaboration: An elaboration which gave the reader a clear idea of a specific action or understanding and probably a sense that the subject was describing what he actually would do.

Questionnaire Meaning Unit #10 (Subject C)

Examiner: Umhm. You said that you underlined things, then what do you do with that?

Subject C:	O.K. Well, umm - Say I'm writing, I've gotten an idea to put in, then I'll write it down and if I - O.K - spelled a word wrong, then I'll underline it and then after I've finished the rough copy, type of thing, I'll go back and get it spelled right or the sentence rearranged or.. **[Elaboration (specific)]**

b. General elaboration: An elaboration which gave only a general idea of an action or understanding and may, because of its generality, leave the reader less assured of having read a true reported action.

Questionnaire Meaning Unit #30 (Subject D)

Examiner:	Would you describe yourself as an organized or a disorganized person?
Subject D:	Sometimes I'm organized, sometimes I'm not. **[Comment (general)]**
Examiner:	O.K. What makes you organized, what makes you disorganized?
Subject D:	Uh, guess the way I feel that day or if I woke up on the wrong side of the bed, I would be disorganized altogether. If I got up on the right side, I'd be organized--how I feel that day. That's about it. **[Elaboration (general)]**

Step Seventeen:

Statements labeled as directed in Step Sixteen were also examined carefully to see if they reflected the spontaneous intent of the subject or whether they parroted, agreed or disagreed with the examiner's comments. Subject A's responses as reflected in Meaning Unit #13 quoted as an example of a general comment above simply repeats the examiner's words and thus the term parroting is added to the labeling of the unit.

By the above examples it may be seen that a single meaning unit could contain more than one utterance and therefore conceivably a combination of words, comments and elaborations could be found within one meaning unit. Further criteria for this labelling may be found in Appendix O.

Results of Analysis Described in Steps Seven Through Nine

General Organization Skill (Questions 1, 7 and 13)

Question 1: Are you on time for class?

Table 62
Response Categories for Question #1

Subject	Yes	No	Usually On Time	Usually Late	Situation Specific
A	X				
B				X (10-15 min)	
C	X				
D			X		
E					X (hard in AM)
F			X		
G					X (except for first periods AM and PM)
Total	2	0	2	1	2

Results of Question 1

Only two of the subjects (A and C) saw themselves as always punctual (see Table 62). Two others (Subjects D and F) felt they were usually on time, while the remaining three (Subjects B, E and G) were consistently late. Thus five out of the seven subjects had some degree of difficulty getting to class on time.

Question 7: Do you think you are tidy about your personal belongings?

Table 63

Response Categories for Question #7

Subject	Yes	No	Sometimes	Situation Specific
A	X			
B			X	
C				X (at home, not at school)
D			X	
E				X (room and notes bad; phys ed. equipment good
F				X (mostly, unless a bad day
G				X (room and locker locker messy; only valuables neat)
Total	1	0	2	4

Results of Question 7

All but one student saw themselves as sometimes tidy and sometimes not tidy (see Table 63). Four of these six were specific about situations in which they were tidier. One student simply saw himself as always being tidy.

Question 13: Do you have pens, erasers, notebooks, etc. on hand?

Table 64

Response Categories for Question #13

Subject	Yes	Usually	Mostly
A	X		
B		X	
C		X	
D	X		
E			X
F	X		
G		X (trouble with pens)	
Total	3	3	1

Results of Question 13

All responses to an inquiry regarding necessary materials were primarily positive (see Table 64). However, four of the seven were

PLANNING SKILL (Questions 2, 9, 14 and 19)

Question 2: ***What do you do in class after the teacher gives you an assignment?***

Table 65

Response Categories for Question #2

Subject	Specifically outlined what he would do	Answered positively without specifics	Answer had negative connotations with specifics	Answer had negative connotations without specifics	Answer did not address question
A				✓	
B	✓				
C	✓				
D	✓				
E			✓		
*F		✓			
G					✓
Total	3	1	1	1	1

Positive Total: 4
Negative Total: 2

*Question form varied with Subject F. He was asked, "Do you know what . . .?"; all others were asked "What do you do . . .?"

Question 9: *Do you set out a plan for how you will do an assignment?*

Table 66

Response Categories for Question #9

Subject	Yes, with example reflecting understanding	Yes, with example reflecting misunderstanding	Yes, unable to give example	No	Depends on situation
A			✓		
B	✓				
C					✓
D				✓ (except for tool)	
E					✓
F				✓	
G		✓			
Total	1	1	1	2	2

Plan: 3 Situational Plan: 2 Don't Plan: 2

forgetful at times. One subject (Subject D) confessed to taking only the minimum of materials with him so that others would not borrow possessions which his experience told him were seldom returned.

Summary Statements on the General Organization Skills

The majority of students (five of seven) seemed to see themselves as having varying degrees of difficulty with punctuality. All but one subject saw tidiness as dependent on circumstance and four out of seven forgot materials with differing frequencies. As a general rule, the majority of students responded to these questions by indicating that they displayed these skills infrequently or inconsistently.

Results of Question 2

Four of the seven subjects related specifically what they would do following their teachers' instructions (see Table 65). Three of these four responses were detailed and reflected direction (Subjects B, C and D), while the fourth (Subject E) showed that the subject sometimes did not know how to proceed. Subject G seemed not to care if he knew what to do as long as he looked like he knew what he was doing. The remaining two subjects did not give specific information about their actions.

Results of Question 9

Five of the seven subjects reported themselves planning or planning situationally (see Table 66). However, of the three who said they did plan, only one could produce an example of planning:

Subject B imaged a design before he began building. One of the three described something other than planning: Subject G said he wrote a title, read, and then wrote. Subject A was unable to describe what he did.

Neither of the two situation-dependent planners were specific in outlining how they planned but rather knew when they planned. Subject C planned for important assignments by deciding what would go in each paragraph while Subject E planned essays but not paragraphs.

Question 14: Do you feel as though you have direction when you are working?

Table 67

Response Categories for Question #14

Subject	Usually Lost	Usually Directed	Situation Dependent
A			X (subject)
B			X (familiarity)
C			X (subject)
D		X	
E			X (subject)
F			X
G			X (high school vs elementary)
Total		1	6

Consistently lost	0
Consistently directed	1
Situationally lost or directed	6

Question 19: ***Do you set priorities when you have to finish a number of assignments or tasks?***

Table 68

Response Categories for Question #19

Subject	Just Starts	Date Due	Arbitrary List	Something Liked First	Boring Last	Hardest First	Easiest First	Urgent	Schoolwork	Teacher	Subject Preference
A	(✓)			☑							
B						✓					
C						✓			✓	✓	
D			(✓)					✓			
E							✓		✓		✓
F		✓					✓				
G					✓		✓				☑
Total	1/16	1/16	1/16	1/16	1/16	2/16	3/16	1/16	2/16	1/16	2/16

Numerator: Number of responses in that category. Denominator: Total number of responses.

Note: Circled responses are those which reflect choices which do not set priorities. Squared responses are those which were a selection of an alternative presented by the researcher. Circled and unmarked responses were spontaneous.

Results of Question 14

Only one of the seven subjects reported feeling directed most of the time (see Table 67). For six subjects, feeling lost or directed depended on a particular situation. Five of the six gave specific information regarding what factors made them feel lost. For three, it was a subject area (two in English, one in Social Studies). One subject usually felt lost the first time he was doing a particular assignment and another felt directed in high school but had felt lost and confused in elementary school.

Results of Question 19

Only two of sixteen responses were indicative of random or arbitrary approaches to work (see Table 68). No subject gave responses only of this type; however, Subject A gave some preference as to what he might do first only when a possible alternative was presented. Subject D gave an indication that he gave consideration to urgency; however, without that factor he used an arbitrary list for guidance.

Summary Statements on Planning Skills

Responses to Question #2 showed that the majority of subjects reported knowing what to do after being given instructions and three of those four could be somewhat specific about their actions. In answering Question #9, however, only one student gave specifics of how he planned, even though five subjects had reported doing some planning. Question #14 revealed that six of the seven subjects felt lost at least some of the time when approaching their school work.

Question #19 showed that only two students reported taking an arbitrary approach to prioritizing their work. In general, it might be said that students found they had difficulty telling how they planned and often lost direction when working.

Inspection Skill (Questions 3, 8, and 5)

Question 3: Do you inspect your work as you go along?

Table 69
Response Categories for Question #3

Subject	Yes	No	Situation Dependent
A	X		
B	X		
C	X		
D			*X
E		*X	
F		X	
G	X		
Total	4	2	1

*Subject checks after the work is completed.

Results of Question 3

Five of the seven subjects inspected their work as they went along with only one of the five saying that his checking was dependent on the type of work he was doing (see Table 69). The latter subject, Subject D, did some checking as he went along (autobody) but for other activities either didn't check (written work) or checked upon completion of the assignment. Subject E did not believe he did an ongoing check but reported that his habit was to go through or have someone else go through his work when it was done. Only Subject F made no mention of checking as he went along or when he was finished. Descriptions of how inspections were done were fairly general (see Table 70) with only one subject actually telling how he would carry out his inspection. Others told why they inspected or simply reworded the researcher's input. Three subjects, however, went beyond the limits of the question to discuss the actions they would impose as a result of their inspections (see Table 71).

Table 70

Classification of Positive Responses to Question #3

Subject	Description	Classification
A	sees if it is right or wrong	Why
B	checks for mistakes	Reworded inquiry
C	reads work after one paragraph	How
D	checks autobody as he goes	Reworded inquiry
G	sees how neat and organized it is	Why

Table 71

Actions Reported as a Result of Inspection

Subject	Action
A	none
B	redoes portions of what he is building as he works
C	changes as he goes
D	none
E	none
F	none
G	underlines headings

Question 8: Do you check back on earlier parts of an assignment as you work?

Table 72

Response Categories for Question #8

Subject	Yes	No	Strategy Employed
A		X	Concentrates on the part he is working on
B		X	Looks ahead rather than back.
C	X		Checks back in Math. In writing concentrates only on the most recently written sentences.
D	X		Stops to think, then checks the last sentence or two.
E	X		Looks back at questions.

(Table continues)

Subject	Yes	No	Strategy Employed
F		X	No elaboration.
*G	X		Reads what he has written and rewrites if it lacks cohesion.
Total	4	3	

*Apparent misunderstanding of the intent of the question may reflect the manner in which it was posed. This response is more indicative of checking after he has written.

Results of Question 8

Four of the seven subjects reported checking back on earlier parts of their assignments as they worked while three said they did not look back (see Table 72). All but one subject (Subject F) was able to be fairly specific about how they approached this type of inspection.

Question 15: Do you see your errors as you work through an assignment?

Table 73

Response Categories to Question #15

Subject	No	Yes	Mostly	Sometimes	Not Asked	Method
A		X				* Reads over
B				X		Always checks but doesn't see them all. Doesn't think he has method.

(table continues)

Subject	No	Yes	Mostly	Sometimes	Not Asked	Method
C				X		Marks them and comes back later so he doesn't lose his train of thought
D			X			* Skims through.
E				X		* Read and redo
F					•X	
G		X				If it feels right or not. * Checks calculations
Total	0	2	1	3	1	

*Students do not clearly indicate by these responses that the checking for errors occurs during rather than after the assignment.

•In answering question #6, this subject said he found it hard to identify errors.

Results of Question 15

Only six subjects were asked if they saw their errors as they worked. All reported some success in spotting mistakes (see Table 73) but four of the six had at least some degree of reservation about their efficiency. However, the elaborative responses of four left the researcher uncertain of whether a clear distinction had been made in their minds about seeing errors while working and proofreading after completing their work.

Table 74

Summary of Responses to Inspection Skill Questions

Subject	Question #3 Do you inspect your work as you go along?	Question #8 Do you check back on earlier parts of an assignment as you work?	Question #15 Do you see errors as you work through an assignment?
* A	Yes	No	Yes
* B	Yes	No	Sometimes
C	Yes	Yes	Sometimes
D	Depends	Yes	Mostly
* E	No	Yes	Sometimes
F	No	No	Not asked
G	Yes	Yes	Yes

*Possible inconsistency of responses.

Summary Statements on Inspection Skills

In answering question #3, five of seven subjects reported doing at least some inspection as they went along but only one subject discussed how he would carry out such an inspection (see Table 70). Question #8 seemed to be quite similar to question #3 and the questions offered what might, on the surface, be somewhat of a reliability check on one another. In question #8 four of the seven subjects reported checking back on earlier parts of their assignments as they worked, making the global results appear similar to question #3. However, a subject by subject comparison shows that only three students gave the same response to both questions (see Table 74). Conflicting responses seemed to indicate that subjects perceived distinct differences in the intent of the question or in the task they considered in giving their responses to the questions. Only Subject D appeared to contradict himself (see Table 75) by reporting different behaviours on one task.

Table 75

Seemingly Conficting Responses to Inspection Questions #3 and #8 Viewed in Greater Detail

Subject	Response to Question #3	Response to Question #8
A	Looks to see if it is right or wrong.	Doesn't check back - concentrates on the part he is working on.
B	Checks for mistakes and redoes portions as he works	Doesn't feel he integrates earlier parts - looks ahead rather than back.
D	Checks autobody as he goes along. Doesn't inspect written work. Might check an exam when finished.	After stopping to think, checks the last sentence or two.
E	Doesn't inspect work as he goes along then goes through or has someone else go through.	Looks back at questions.

The same indication that the two questions did bring to mind similar yet discrete aspects of inspection may be found in the summarized responses of two of the three who responded in the same manner to both questions (see Table 76).

Table 76

Seemingly Similar Responses to Inspection Questions #3 and #8 Viewed in Greater Detail

Subject	Response to Question #3	Response to Question #8
D	At first he said "not really." Reads work over after one paragraph. Checks as he goes rather than waiting until the end. Changes as he goes.	Checks back in Math. In writing, looks back only at most recently written sentences.
F	No	No
G	To see how neat and organized it is. Underlines headings.	Reads what he has written and will rewrite if it lacks cohesion.

In responding to question #15, all six subjects asked felt they saw some errors. It was difficult to tell, however, if four of the subjects had differentiated between the intent of the question and proofreading after the fact.

Regulation Skill (Questions 4, 10, 16 and 20)

Question 4: **Do you start your assignment as soon as your teacher finishes giving directions?**

Table 77
Response Categories for Question #4

Subject	Yes	No	Situation Dependent	Comments
A		Ⓧ		Thinks what to do.
B			X	If nothing else he would rather do.
C	X			Doesn't like to put things off in case he forgets.
D			X	What the rest of the class does affects him.
E			X	If reading is involved he may not be able to start.
F		X		Wants to put off work because it's boring.
G		X		Takes a breather first.
Total	1	3	3	

Note: Circled response indicated a delay for planning.

Results of Question 4

Only one subject (Subject C) responded with an unqualified affirmative response to the question regarding prompt initiation of assignments (see Table 77). Of the three subjects who said they did not begin assignments as soon as directions are given, one (Subject A) said he planned what to do before he started. Of the three situation-dependent responses, two (Subjects B and D) said they sought out cues from the environment before beginning. Only one subject (Subject E) mentioned the fact that lack of skill in reading might prevent his working.

Question 10: Do you work out more than one solution to a problem?

Table 78
Response Categories for Question #10

Subject	No	Usually Not	Yes	Sometimes	Comments
A				X	None
B			X		Chooses easiest or compiles features from many in building Tries different ones in Math.
C				X	The odd time - not often.
D		X			Thinks of one and thinks it is the best - agreed he might think of more than one.

(table continues)

Subject	No	Usually Not	Yes	Sometimes	Comments
E	X				Not really.
F	X				No
G	X				No
Total	3	1	1	2	

Results of Question 10

Only one subject (Subject B) gave an unqualified affirmative response when questioned regarding making alternative plans (see Table 78). Three flatly said they did not (Subjects E, F and G), while two others (Subjects C and D) indicated making more than one plan was a rare happening.

Question 16: Do you make corrections as you work?

Table 79

Response Categories for Question #16

Subject	Yes	Sometimes	No	No but does later
A	X			
B				X
C				X
D				X
E		X		
F			X	
G			X	
Total	1	1	2	3

Results of Question 16

Only one subject (Subject A) reported without qualification that he made corrections as he worked (see Table 79). Five of the seven (Subjects B, C, D, F and G) stated that they did not correct as they worked, but three of those (Subjects B, C and D) said they made corrections once they had finished an assignment.

Question 20: Do you usually carry through to the end of an assignment?

Table 80

Response Categories for Question #20

Subject	Yes	No	Sometimes	Reason
A			X	Sometimes loses track.
B			X	Doesn't finish if he doesn't like it.
C			X	Depends on subject.
D			X	If others talk, so will he.
E			X	Sometimes daydreams in English class.
F	X			
G			X	Sometimes rests or draws. Never does a reading assignment in a text.

Results of Question 20

Only one subject (Subject F) reported carrying through to the end of an assignment (unless a legitimate problem is encountered) without qualifying his response (see Table 80). Four of those who admitted to not always carrying through gave reasons which reflected conscious decisions to do something else, while two others (Subjects A and E) gave reasons which, while controllable (i.e., losing track and daydreaming), were not clear refusals to work.

Summary Statements on Regulation Skills

Six out of the seven subjects did not begin their assignments immediately, but only one of those six reported being delayed by a skill deficit. Six of the seven subjects did not regularly work out alternative solutions to problems. Only one subject reported in an unqualified manner that he made corrections as he worked, and only one student reported firmly that he carried through to the end of an assignment unless stopped by skill deficit or by not understanding the assignment. Regulation of work seemed largely absent in this group.

Verification Skill (Questions 5, 11 and 17)

Question 5: **Do you think about whether you have done what the teacher has asked you to do?**

Table 81

Response Categories for Question #5

Subject	No	Yes	Situation Dependent	Elaboration
A		Ⓧ		Thinks about it.
B		X		Extends beyond what the teacher asked.
C	X			Guesses he should. Usually tries to be very sure he's on the right track before he starts
D		X		None
E			X	Math - yes. Algebra - no. English - somtimes.
F	X			Doesn't want to know if he's wrong.
G	X			Compares with classmates
Total	3	3	1	

Circled response is equivocal.

Results of Question 5

Most subjects did not qualify their responses or indicate that circumstances would change their behaviours when considering whether they compared their completed work with the teacher's instruction (see Table 81). Only one subject (Subject D) saw his behaviour as situation specific. The remainder of the subjects were equally divided between yes and no responses. The two elaborated affirmative answers were an agreement (Subject A) and a conviction that produced work went beyond the voiced requirements (Subject B). The latter response was categorized as affirmative with some degree of assumption that a comparison would need to be made with the given assignment in order to feel one had moved beyond it. However, arguments might be offered for interpreting the response as a no. The three negative responses included an avoidance technique (Subject F), (which proved to be a pattern with this subject), and two alternate strategies. Subject C spent extra time being sure he understood an assignment before he began, while Subject G checked his work against the others in the class. Subject E seemed very aware of subject areas where he did and did not employ the strategy.

Question 11: **Do you check for errors when you finish an assignment?**

Table 82

Response Categories for Question #11

Subject	No	Yes	Situation Dependent	Descriptor
A		X		Reads to himself or someone else.
B		X		Goes over work. On exams prefers working quickly and checking to working slowly.
C		X		Rereads.
D		X		Autobody - yes. English checks neatness, not content.
E			X	Math - no. English - sometimes.

(Table continues)

Subject	No	Yes	Situation Dependent	Descriptor
F	X			No
G		X		Looks over work but not concerned if he can't do corrections.

Results of Question 11

Six of the seven subjects reported some degree of checking for errors, with only one of the six (Subject E) saying his strategy was employed on a situation-specific basis (see Table 82). Only one subject (Subject F) said that he never checked. Interestingly, while three subjects offered some detail as to when they checked for errors, i.e., exams (Subject B), or subject matter (Subjects D and E), descriptions of how they checked were limited to one comment about speed (Subject B) despite attempts to draw out more information.

Question 17: Do you proofread your written assignments?

Table 83

Response Categories for Question #17

Subject	No	Yes	Sometimes	Comments
A			X	Value is getting to know about errors.
B		X		Reads it over.
C	X	X		

(table continues)

Subject	No	Yes	Sometimes	Comments
D	X			
E				Mom does.
F			X	Proofs essays.
G		X		
Total	2	3	2	

Results of Question 17

Five out of the seven subjects did some proofreading (see Table 83). No elaborative comments regarding the specifics of methodology were mentioned. One student (Subject E), whose reading problems were extremely severe, had his mother do his proofing.

Summary Statements on Verification Skills

Checking for errors and proofing were reported as employed strategies to some degree by six and five of the subjects respectively. However, the subjects could not describe specifically how they worked and spoke instead in very general terms, i.e., "reread" or "look over work." The subjects were more divided on whether they compared finished products with the teacher's assignment. Those employing that approach exceeded those who did not by one. However, once again, descriptors of specific strategies were not given.

Correction Skill (Questions 6, 12 and 18)

Question 6: Do you make corrections without your teacher's help?

Table 84

Response Categories for Question #6

Subject	No	Yes	Situation Dependent	Comments
A		X		Changed his mind no to yes.
B			X	If he has the capability.
C		X		Marks errors and returns to them later. Utilizes others.
D			X	Not if he is tired or mad.
E		X		Goes back and corrects.
F			Ⓧ	Finds it hard to identify errors.
G			X	If there is time. Often waits 'til corrections are taken up in class.
Total	0	3	4	

Circled response indicates a response to a question which was not phrased properly.

Results of Question 6

All subjects felt that they could make corrections independently, at least in some situations. Four (Subjects B, D, F and G) saw themselves correcting in a situation-dependent manner. Subject C outlined the methodology he used in some detail while the others used more general descriptors. Subjects B and F alluded to skill deficiencies hampering their ability to find errors. Subject D admitted to his performance being affected by mood, while Subject G knew that his work could be corrected without his exerting effort simply by his relying on others.

Question 12: Do you edit or rewrite original draft work?

Table 85

Response Categories for Question #12

Subject	No	Yes	Always	Situation Dependent	Sometimes	Usually
A					X	
B		X				
C						X
D			X			
E			X			
F					X	
G				X		
Total	0	1	2	1	2	1

Results of Question 12

All subjects reported doing editing or rewriting on original work although there was some variation in how frequently subjects saw themselves engaged in this strategy (see Table 85). Two (Subjects E and E) said they always edited. Comments revealed varying degrees of specificity in the subjects' knowledge of their approaches (see Table 86).

Table 86

Descriptions of Editing Methods

Subject	Comments
A	Rewrites.
B	Scratches out and uses arrows on rough copy and then rewrites.
C	Does only a first and second copy.
D	Always does a rough and a good copy.
E	* Rewrites on a new paper. (Has to because of all the red ink.)
G	An assignment is like presenting yourself, (yet only puts effort into important assignments).

---

*Subject E did not appear to interpret editing as an independent activity in this situation.

Question 18: Do you hand in what you would call a polished product?

Table 87

Response Categories for Question #18

Subject	No	Yes	Situation Dependent	Elaborations
A		X		
B			X	Puts more effort into a class in jeopardy or one he likes.
C			X	More time on important assignments. May not redo obvious weak areas in lesser assignments.
D			X	Writing if interested. Autobody is the best he can do.
E			X	If he is not required to do it in class. Never hands in in-class assignments - they are unreadable.
F	information not recorded for this subject			
G			Ⓧ	Often not neat as left to the last minute.

Circled response less often polished.

Results of Question 18

Six of six subjects saw themselves as handing in polished products (see Table 87). All the subjects who elaborated on their responses seemed to have a fairly clear idea of when or where their work was more acceptable. Four of the students (Subjects B, C, E and G) mentioned some aspect of time in their answers. Other factors mentioned were the factors of possible failure (Subject B); the importance of the subject (Subject C); interest in the subject (Subject D); or liking a subject (Subject B). Subject E, who had severe reading problems, knew he was completely unable to function independently on in-class assignments but could hand in something which could be a source of pride if he was given time.

Summary Statements on Correction Skills

All subjects felt that at least in some circumstances they were able to make independent corrections, edit or rewrite, and hand in a polished product. In the case of corrections and producing polished work, situation specificity seemed important to the majority of students. Most students used qualifiers when referring to the degree to which they edited or rewrote original work.

Results of Analysis Described in Steps Ten and Eleven

Table 88 shows the number of responses assigned to "yes," "no" and "sometimes" categories. These responses encompassed all the verbalizations of all subjects on the Questionnaire on Organizational Skills, "Yes" statements included those which were strongly affirmative while "no" statements were strongly negative. No attempt was made to distinguish between usually, sometimes, and all other situation-dependent comments; they were all labelled as "sometimes."

Table 88

Actual Number of Yes, No, and Sometimes Responses to Categories of the Questionnaire on Organizational Skills

	Skills																																			
	Of 3 Gen Org					Of 4 Planning					Of 3 Inspection					Of 4 Regulation					Of 3 Verification					Of 3 Correction					Of 20 Total						
Subject	Y	N	S	Ex	Sp Ex	Y	N	S	Ex	Sp Ex	Y	N	S	Ex	Sp Ex	Y	N	S	Ex	Sp Ex	Y	N	S	Ex	Sp Ex	Y	N	S	Ex	Sp Ex	O	Y	N	S	Ex	Sp Ex	% Sp Ex
A	3	0	0	(0)	[0]	1	0	3	(4)	[2]	2	1	0	(3)	[1]	1	1	2	(3)	[1]	2	0	1	(2)	[0]	1	0	2	(2)	[0]	20	10	2	8	(16)	[4]	20%
B	0	1	2	(2)	[1]	2	1	1	(4)	[2]	2	1	0	(3)	[1]	2	1	1	(4)	[2]	3	0	0	(2)	[1]	2	0	1	(3)	[3]	20	11	4	5	(18)	[10]	50%
C	1	0	2	(1)	[1]	2	0	2	(4)	[4]	2	0	1	(3)	[3]	2	0	2	(3)	[3]	2	1	0	(2)	[1]	2	0	1	(3)	[3]	20	11	1	8	(16)	[15]	75%
D	2	0	1	(2)	[1]	2	1	1	(3)	[3]	2	0	1	(2)	[2]	0	0	4	(4)	[3]	2	1	0	(1)	[1]	1	0	2	(3)	[2]	20	9	2	9	(15)	[12]	60%
E	0	0	3	(2)	[1]	1	0	3	(4)	[2]	1	1	1	(3)	[2]	0	1	3	(3)	[2]	0	1	2	(3)	[3]	2	0	1	(2)	[2]	20	4	3	13	(17)	[12]	60%
F	1	0	2	(2)	[1]	2	1	1	(2)	[0]	0	2	0	(0)	[0]	1	3	0	(1)	[0]	0	2	1	(2)	[0]	0	0	2	(3)	[0]	18	4	8	6	(10)	[1]	5.5%
G	1	0	2	(3)	[3]	3	0	1	(4)	[3]	3	0	0	(3)	[2]	1	3	0	(3)	[3]	3	0	0	(2)	[2]	2	1	0	(2)	[2]	20	13	4	3	(14)	[12]	60%

Abbreviations:
Gen Org: General Organization
Y: Yes
N: No
S: Sometimes
Ex: Example
Sp Ex: Spontaneous Example
O: Overall
%: Percent

The reason for keeping the equivocal label somewhat more general than those labels used for the instructors' format was based on the differences in how the questionnaires were administered to each group. While teachers read the Questionnaire and then checked a category of their choice, the students took part in an oral interview. The examiner found that it was too subjective to assign specific labels to statements which indicated a variation in use of a particular strategy. Labels were therefore kept to the two dichotomous stands of "yes" and "no" and a third descriptor which would indicate a mid-level response.

In viewing the summarative results of the response labelling outlined in Table 88, it is seen that subjects on the whole viewed themselves as being more organized than disorganized. Four of the subjects (Subjects A, B, C and G) made strongly affirmative responses to half or more of the questions posed to them. Subject D made the same number of "sometimes" statements as affirmative responses, while Subject E's replies were predominantly situation-dependent. Only Subject F made more strongly negative responses than affirmative or situation-dependent responses.

Most subjects could be probed into expanding on simple agreements or disagreements. These expansions are recognized under "example" in Table 88. However, when only those examples given spontaneously are counted, there is a marked drop in the number of expansions noted (see Table 88). Subject C used the greatest number of spontaneous examples with seventy-five percent of his responses being amplified without request. Three subjects (Subjects D, E and G) used examples spontaneously in sixty percent of their responses while Subject B did so in fifty percent of his answers. Subjects A and F offered considerably lower proportions of spontaneous examples of twenty and five and a half percent respectively. Both subjects A and F could be termed culturally different with Subject F also being of very low socioeconomic status.

Results of Analysis Described in Steps Twelve Through Fourteen

Each subject's responses to the questions on the Questionnaire on Organizational Skills were quantified. Affirmative responses were assigned a 3, "sometimes" responses a 2, and negative responses a 1. By totalling the number of possible points for the responses making up a particular category and indicating how many points had been achieved, ratio scores were devised for each of the six organizational areas (see Table 89). So that comparisons could be made more easily between areas, ratio scores were converted to decimal scores (see Table 90). Using this method it was possible for one subject to have equivalent scores in more than one area. In examining the skill areas one sees that the greatest number of subjects (three) achieved their highest ratings in General Organization and Inspection skills. The skill areas of Planning and Inspection received no highest ratings and Regulation skills were rated lowest by three subjects, making it more clearly a generalized area of difficulty. General Organization, with two lowest ratings as well as three highest ratings, was not as clearly a generalized area of achievement.

Table 89

Quantified Scores of Responses to Categories of Questionnaire Regarding Organizational Skills

	Skill					
Subject	General Organization	Planning	Inspection	Regulation	Verification	Correction
A	9/9	9/12	7/9	8/12	8/9	7/9
B	5/9	9/12	7/9	9/12	9/9	8/9
C	7/9	10/12	8/9	10/12	7/9	8/9
D	8/9	9/12	8/9	8/12	7/9	7/9
E	6/9	9/12	6/9	7/12	5/9	8/9
F	7/9	9/12	*2/9	7/12	4/9	*4/9
G	7/9	11/12	9/9	5/12	9/9	7/9

Numerator = Subject's score   Denominator = Possible score

*lowered artificially due to misunderstanding, omission or inaudible response

Table 90

Highest and Lowest Ratings of Responses to Categories of Questionnaire Regarding Organizational Skills

Subject	Skill General Organization	Planning	Inspection	Regulation	Verification	Correction
A	①	.75	.78	$\boxed{.67}$	.89	.78
B	$\boxed{.55}$	.75	.78	.75	①	.89
C	$\boxed{.78}$	.83	$\textcircled{.89}$	.83	$\boxed{.78}$	$\textcircled{.89}$
D	$\textcircled{.89}$	.75	$\textcircled{.89}$	$\boxed{.67}$	.78	.78
E	.67	.75	.67	.58	$\boxed{.56}$	$\textcircled{.89}$
F	$\textcircled{.78}$	.75	$\boxed{*.22}$	.58	.44	*.44
G	.78	.92	①	$\boxed{.42}$	①	.78

Circled score is the highest for that subject. Squared score is the lowest for that subject.
* lowered artificially.

One of the most important findings of the study was that three of the four subjects (Subjects A, D and G), who rated themselves as poorest in regulation skills (see Table 91) were those who could not regulate their task behaviour on the Rods and Text Search Tasks even though they could verbally explain how to do the tasks (see Table 39). Subject E, the other subject who rated himself low in regulation skills, was able to regulate his actions in the Rods Task but could not do so in the Text Search Task.

Results of Analysis Described in Step Fifteen

In comparing subjects' ratings of themselves to their teachers' ratings, a wide range of similarities and differences may be seen (see Tables 91 and 92). In general, it may be said that the teachers in less academic settings were more likely to have ranked organizational skills in the same way as the students had ranked them when it came to students' difficulties or low rankings. Subjects B, C, E and F ranked themselves lowest in the same organizational skills that their teachers in less academic settings had seen as these students' weakest areas. Only one academic teacher ranked a student lowest in the same skill area which the student himself had seen as most troublesome (Subject F). Highest rankings, which agreed with the students' rankings, were more equally distributed between teachers in academic and less academic roles, with three identical rankings between students and teachers for each group.

Corresponding rankings by students and their teachers in highest and lowest ranked skills were found chiefly in two skill areas.

Table 91

Categories on the Questionnaire on Organizational Skills Assigned Highest and Lowest Ratings

Rater	Rating Highest	 Lowest
Subject A	General Organization	Regulation
LAS	General Organization	Verification
AS	General Organization	Planning Correction
Subject B	Verification	General organization
LAS	Inspection	General Organization Verification Correction
AS	General Organization	Correction
Subject C	Inspection Correction	General Organization Verification
LAS	General Organization	Verification
AS	General Organization	Inspection
Subject D	General Organization Inspection	Planning Regulation
LAS	Planning	Correction
AS	General Organization	Inspection
Subject E	Correction	Verification
LAS	Correction	Verification
AS	General Organization	Regulation

(table continues)

Rater	Rating Highest	 Lowest
Subject F	General Organization	* Inspection * Correction Verification
LAS	General Organization	Inspection Verification
AS	General Organization	Correction
Subject G	Inspection Verification	Regulation
AS1	General Organization	Verification
AS2	General Organization	Verification

Abbreviations: LAS = Less Academic Setting
AS = Academic Setting
AS1 = Academic Setting One
AS2 = Academic Setting Two

*lowered artificially

Three subjects (Subjects A, D and F) and their "academic" teachers rated General Organization skills most highly. Subjects A and F and their teachers from less academic settings also rated General Organization as highest. Subject E and his "less academic" teacher rated his correction skills most highly (see Table 93). Students and their teachers agreed most often that Verification skills were low. Subjects A, E, F and their "less academic" teachers agreed in this ranking, while one of Subject G's "academic" teachers made the same low ranking as he had when reporting on Verification skills. Subject

Table 92

Categories on the Questionnaire on Organizational Skills Assigned Highest and Lowest Rankings by Subjects and their Teachers

	Highest Rankings						Lowest Rankings					
	GenOrg	Plan	Inspect	Regulate	Verify	Correct	GenOrg	Plan	Inspect	Regulate	Verify	Correct
Subject A	⊘									✓		
Teacher LAc	*⊘										✓	
Teacher Ac	*⊘							✓				✓
Subject B					✓		☑					
Teacher LAc			✓				▽⊘					
Teacher Ac	▽☑										✓	✓
Subject C			☑			✓	☑					
Teacher LAc	*☑										⊘	
Teacher Ac	*☑								☑		⊘	
Subject D	⊘		✓					✓				
Teacher LAc		▽✓								✓		
Teacher Ac	⊘							▽✓				✓
Subject E						⊘					⊘	
Teacher LAc						⊘					⊘	
Teacher Ac	✓									✓		
Subject F	⊘								⊘		⊘	⊘
Teacher LAc	*⊘								⊘		⊘	
Teacher Ac	*⊘											⊘
Subject G			✓		✓					✓		
Teacher Ac^1	*✓										*✓	
Teacher Ac^2	*✓										*✓	
Total	14	1	4	0	2	3	3	3	3	4	10	5

Abbreviations:
LAc: Less Academic Setting
Ac: Academic Setting
Ac^1: Academic Setting One
Ac^2: Academic Setting Two
GenOrg: General Organization

Circled scores indicate student/teacher agreement.
Squared scores indicate student/teacher disagreement.
Square over circle indicates both agreement and disagreement.
*indicates that the teachers agree
▵indicates that the teachers disagree

F and his teachers also ranked him lowest in Inspection (less academic setting) and Correction (academic setting) skills.

Student/teacher disagreement on highest and lowest rankings was seen in the discrepancy between Subject B and his academic teacher regarding his General Organization skills. He reported problems not perceived by his teacher. Subject C's rankings conflicted with both his teachers' ratings. His "academic" teacher and "less academic" teacher both saw his strength in General Organization, his perceived "lowest ranked skill". He ranked himself highest in Inspection skills, the area ranked lowest by his academic teacher.

Teachers in academic and less academic settings agreed that subjects A, C, F and G were best in General Organizational Skills. Only one student was rated lowest in one skill by two teachers. Interestingly, the subject in question was Subject G, the only subject who was rated by two teachers from academic settings. Both of Subject G's teachers rated him lowest in Verification Skills (see Table 93). In summary, there was more agreement by teachers in academic and less academic situations among themselves when it came to ranking what they perceived as their student's best skill areas. Thus there was more conformity of opinion between teachers of the same pupil regarding their student's Highest Rankings than there was regarding his Lowest Ranking.

Teachers in academic settings rated subjects oppositely from teachers in less academic settings when rating highest and lowest organizational skills for the same subject in only two instances. Subject B was ranked highest in General Organization skills by a

Table 93

Classification of Responses to the Questionnaire on Organizational Skills as to Length and Preciseness

	Total Verbalization Units			Words						Comments						Elaborations						Questions
				General			Precise			General			Precise			General			Precise			
Subject	Overall	Own(%)	A/D/P	Total	Own	A/D/P	Total	Own	A/D/P	Total	Own	A/D/P	Total	Own	A/D/P	Total	Own	A/D/P	Total	Own	A/D/P	
A	86	29(34%)	*57	*$\boxed{45}$	*6	*$\underline{39}$	*2	*1	1	27	⑰	*10	11	5	*6	1	1	0	0	0	0	
B	*102	72(71%)	30	25	5	$\underline{20}$	0	0	0	*$\boxed{41}$	*㉛	*10	5	5	0	*17	*17	0	10	10	0	4
C	63	50(79%)	13	13	3	$\underline{10}$	0	0	0	16	14	2	11	10	1	4	4	0	*$\boxed{17}$	*⑰	0	2
D	48	33(69%)	15	11	3	$\underline{8}$	1	0	1	8	3	5	6	5	1	7	7	0	$\boxed{15}$	⑮	0	
E	82	*73(89%)	9	9	4	$\underline{5}$	*2	*1	1	$\boxed{25}$	㉔	1	*18	*15	3	8	7	1	16	16	0	4
F	55	27(49%)	28	$\boxed{26}$	1	$\underline{25}$	*2	*1	1	14	⑬	1	12	11	1	0	0	0	1	1	0	
G	76	58(76%)	17	15	3	$\underline{12}$	*2	0	*2	$\boxed{21}$	⑱	3	10	9	1	11	11	0	*17	*17	0	

Note: Because of the manner in which the transcripts were divided into Meaning Units as well as the interactive nature of the discussions, the distinction between comment and elaboration is not based entirely on a natural linguistic unit.

Circled numbers indicate the highest number of his own responses in a category for that subject.
Squared numbers indicate the highest number of total responses in a category for that subject.
Underlined numbers indicate the highest number of A/D/P responses in a category for that subject.
* numbers indicate the subject whose number of responses is highest in that category.

Abbreviations:
%: percent
A/D/P: Agreee/Disagree/Parrot

teacher in an academic setting and lowest in the same skill by one of his teachers in a less academic setting. Subject D's "academic" teacher ranked him highest in Planning skills, the same area in which his "less academic" teacher ranked him as lowest.

Results of Analysis of Steps Sixteen and Seventeen

In breaking meaning units from the transcripts down into words, comments and elaborations, definite patterns developed for individual subjects. The further step of describing each of the three classifications as General and Precise also yielded valuable information.

As can be seen by Table 93, idiosyncratic patterns developed. In viewing total responses in each category, two subjects (Subjects A and F) had the majority of their verbalizations classified as General Words. Three other subjects (Subjects B, E and G) had the highest number of responses classified as General Comment. The two remaining subjects (Subjects C and D) had the majority of their statements classified as Precise Elaborations.

These patterns changed only somewhat when considering just the responses which were the subjects' own spontaneous statements; that is, statements which were not merely agreements or disagreements or parrotings of the examiner's words. Subjects A and F in this investigation are seen to make more General Comments than any other type of response. All other subjects' own verbalizations maintained the same patterns as when total responses in each category were considered.

It is interesting to note the variation from subject to subject in the use of personalized responses and the use of statements which either parrot the examiner or act as simple agreements or disagreements with her words. The range of percentages of the subjects' own spontaneous responses vary from thirty-four to eighty-nine percent which are the percentages of Subject A and Subject E respectively. Four other subjects (Subjects C, G, B and D) had percentages between seventy-nine and sixty-nine. Subject F, like Subject A, had a much lower incidence of use of his own verbalizations, having a percentage of only forty-nine. All subjects tended to agree/disagree or parrot General Words more than any other category of responses (see Table 93).

Global Statements Regarding Organizational Ability

Each subject was asked whether or not he viewed himself as being organized. Two subjects, (Subjects A and B) saw themselves as organized, two, (Subjects F and G) as disorganized, and the remainder felt their organization was dependent on circumstances. In Table 94 the subjects' opinions of their organizational ability is compared with their teachers' opinions. For four subjects there is some degree of agreement between self-opinion and teacher opinion. Subjects F and G were seen as disorganized by both of their teachers while Subject D and E's opinions regarding situational organization seem to be supported in that they are seen as being disorganized in academic settings but organized in nonacademic settings. Once again Subject A stood apart from the others being the only subject whose opinion differed from both of his teachers.

Table 94

A Comparison of Self and Teacher Organizational Classifications

Subject	Self	Academic Setting	Less Academic Setting
A	Organized	Disorganized	Disorganized
B	Organized	Disorganized	Organized
C	Depends - fairly organized	Organized	Organized
D	Sometimes organized, sometimes not	Disorganized	Organized
E	Organized - sometimes disorganized, I've been told	Disorganized	Organized
F	Disorganized	Disorganized	Disorganized
G	Disorganized	Disorganized Disorganized	n/a

INTERVIEW REGARDING STUDY HABITS

Note: Procedural steps from Chapter IV: Methodology, are repeated here. (See Appendices W through Z for analysis details.)

Procedure

The interview under discussion was based on the subjects' knowledge and feelings regarding their abilities and study habits. These interviews were analyzed in a manner similar to that utilized by Giorgi (1975). The steps in the analysis included data reduction and interrogation of the verbal protocol and were as follows:

Step One:

All exchanges were transcribed verbatim.

Step Two:

The subjects' verbalizations were segmented into meaning units by examining the transcripts in an open manner with as little consideration of the aims of the study as possible.

Interview Transcription (Subject C)

Examiner: O.K., so you think that the main reason why people do well in school is that they take the time and put more effort into it.

Subject C: Umhum.

Examiner: Anything else?

Subject C: Mmm, [things come easier to them.

Examiner: What do you mean by things?

Subject C: Umm, they find it easier to, umm, learn things, and learn, you know, the subject, and uh things like that.] 14

Examiner: O.K. What do you do when you're left pretty well on your own to do an assignment like, say, writing an essay? What would you do in a situation like that?

Subject C: Umm. [Study up on it and make notes on what it says and take the text and whatever we've got to study from and then I don't think if a person takes it just right out from the book, they're not learning anything, obviously, and I try to put it in my own words,] whether, 15
you know, sometimes [I try to get the point across and don't realy so I don't do so well and then others I will do quite well.] 16

Examiner: Umhum. So you feel quite comfortable about doing something like that on your own.

Subject C: [Umhum, oh, yeah.] 17

Examiner: And that's the procedure you follow.

Subject C: I don't, yeah, [I don't like working with another person, you know, because that tends to ruin it [Laughs] They don't, together, we don't get exactly the right, you know, we spend more time talking and doing something else than working and it doesn't turn out so well.] 18

Examiner: O.K. You said the "other materials." What would be some of the materials that you would use?

Subject C: [Um, well, it would depend on what it is, like if we're doing (indiscernible) then it would be more of an encyclopedia, something like that.] 19

__Step Three__:

All meaning units were restated as simply as possible as themes, i.e.:

Meaning Unit #18 from Interview Transcription (Subject C)

Subject C: I don't - yeah - I don't like working with another person, you know - because that tends to ruin it. [Laughs] They don't - um - together we don't get exactly the right - you know, we spend more time talking and doing something else than working and it doesn't turn out so well.

Interview Theme #18 (Subject C)

Feels working with a partner is not efficient.

Interestingly, in the case of the less verbal students extracting an interview theme did not always mean a condensation of the unit but with some statements it meant elaborating on the terse responses, i.e.:

Meaning Unit #5 from Interview Transcription (Subject A)

Examiner: Have you ever been interested in Social Studies or English in the past? [Subject had previously singled out these subjects as difficult areas.]

Subject: No.

Examiner: It's always been something you haven't liked very much?

Subject A: Yeah.

Interview Theme #5 (Subject A)

He has never been interested in or liked Social Studies or English (response to examiner's suggestions).

Step Four:

Summary descriptors were written for each subject's responses to the following groups of questions:

1. 1 through 2b
2. 3
3. 5
4. 4 and 4a
5. 9

Note: The above numbers correspond to question numbers from the Interview Regarding Study Habits found in Appendix J. For these summaries, both thematic statements and the original transcripts were consulted.

Step Five:

Summary tables for each of the five summaries were constructed and the results outlined. Those summary descriptions, tables and results follow the present procedural outline.

Step Six:

Each meaning unit and corresponding theme for Questions 3, 4, 6, 7 and 9 was then examined to see if it gave either an indication of the student's knowledge of his study and work habits and/or if it revealed an awareness of how he regulated those habits. The procedure was one of labelling the theme appropriately. Giorgi (1975) would refer to this procedure as interrogating the data in terms of the questions of the study.

Interview Theme #7 (Subject C)

> Found school hard because he found it difficult to read [knowledge of] and felt he should have taken more time [awareness of the need for a regulatory action].

Decisions as to whether to place a "knowledge of" or "regulatory" label on a statement were guided by the work of Brown and Palincsar (1982) quoted in Table 95 of the present study. Essentially, knowledge about cognition was assigned to statements reflecting the subject's conscious access to knowledge of his behaviours and study habits, while regulation statements were those which revealed elements of planning, monitoring and checking outcomes. See Table 95 for an outline of the criteria derived from Brown and Palincsar (1982).

Notations were also made when the subject seemed at a loss as to what to do or used a statement reflective of lack of knowledge as to how he learned or how he could regulate his learning. Examples of such behaviours can be seen when the subject reports being totally helpless in a relatively straightforward situation and can progress only by turning the problem over to another.

Step Seven:

Following the same procedures used in Step Six, transcripts and themes were interrogated to see if "knowledge of" statements gave general or specific information.

Table 95

Criteria for "Knowledge Of" and "Regulatory" Labels Assigned to Interview Statements

Label	Criteria from Brown and Palincsar (1982)
Knowledge of	Conscious access to one's own cognitive operations Reflection about the cognitive operations of others
Regulatory	Planning - prior - Predicting outcomes - Scheduling strategies - Using forms of vicarious trial and error Monitoring - during - Monitoring - Testing - Revising - Rescheduling Checking outcomes - Evaluate efficiency and effectiveness

Interview Theme 19 (Subject C)

Uses the encyclopedia if asked to write a paper **[knowledge of (general)]**

Interview Theme 24 (Subject D)

Types because his writing is so poor but many marks are lost because of typographical errors **[knowledge of (specific)]**

Step Eight:

The total number of themes falling into Specific "knowledge of," general "knowledge of," and "regulatory" were ranked and compared with the rankings of the same three groupings of themes labelled as spontaneous to see if the two were constant, similar or differing. For example:

		General	Specific	Regulatory
Subject A	Total	1	2	3
	Spontaneous	1	3	2
	(Differing)			
Subject C	Total	3	2	1
	Spontaneous	3	2	1
	(Constant)			

Step Nine:

Themes and transcripts of responses to Questions 3, 4, 6 and 7 were again examind to see if the subject's statements were spontaneous or if they were parrotings of or agreements with the examiner's statements.

The labelling of statements as spontaneous versus prompted is somewhat artificial as the majority of statements were not truly spontaneous but initiated by direct questioning. Statements were labelled prompted when the examiner offered a suggestion which was subsequently responded to with a yes, no or sometimes. For example, if the examiner said, "Do you talk out loud to yourself when you study?" and the subject said, "Yes," the theme S. talks aloud when studying was labelled as a prompted theme. Prompted labels were also ascribed to themes bearing information which the subject had merely parroted from the examiner's probes. If the subject expanded in any way on the examiner's words, his response was counted as spontaneous. For example, if the examiner said, "Have you ever tried taping?" and the subject responded, "Taping a class? I used to tape but I haven't taped this year at all," the theme has taped classes in the past but not presenty was labelled as a spontaneous theme.

> Note: In labelling themes, content of the verbatim transcript was essential in separating "knowledge of" from "regulatory" statements as well as determining the degree of specificity reflected by the statement. Taken out of context, the themes did not always give sufficient information for labelling.

Step Ten:

Information gleaned from the Interview, data reduction and data interrogation formed the basis for information used to compile portions of individual case studies.

Results of the Analysis Described in Steps Four and Five

Data from the Interview Regarding Study Habits from Questions 1, 2b, 3, 5, 4 and 4a, as well as 9 were interrogated according to Steps Four and Five of the procedure for data analysis were described in the previous section of the present chapter. The format used in the following discussion presents a summary descriptor, summary table and results section for each question grouping oulined.

Knowledge and Feelings About Intellectual Ability - (Questions 1 through 2b of the Interview)

Question 2a:	Question 2b:
Had anyone ever told you before that you had good intellectual ability? If yes, who?	What did you think or how did you feel about learning that you had good intelligence?

Summary Descriptors A

Subject A	Told by friends and Math teacher within the previous two years.	Pleased
Subject B	No one had told him.	Felt he was intelligent because of his novel ideas.
Subject C	Thought he was intelligent but not good - thought something was missing cognitively.	Surprised.
Subject D	Teachers always said he had the potential but not the desire.	No reaction.
Subject E	Told by mother and a clinician when tested in Grade 5.	Good - confirmed that he wasn't stupid.

Subject F

Teachers had told him his ideas revealed a good mind - told about writing tests.	Didn't think much.

Subject G

Yes - Mom thought he was and a couple of teachers said he didn't work to potential; however, he thought he had an IQ of 80.	That he could use it if he really tried.

Table 96

Summary of Knowledge and Feelings About Intellectual Ability

Subject	Did anyone ever tell you you were bright?	Who	When
A	Yes	Friends and Math teacher	In previous two years
B	No	Own feeling	No specific reference
C	* Yes, but something missing - didn't think he was good	No specific reference	No specific reference
D	Yes	Teachers	Always
E	Yes	Mother, Clinician	Grade 5
F	Yes	Teachers	After tests
G	Yes, but didn't think I was that bright	Didn't believe mother or teachers	No specific reference

*Not asked directly because of his spontaneous contribution.

Results of Questions 1 through 2b

Students' responses to this question were complex. What they had been told and what they appeared to believe were not always the same. For example, although Subject D had never been told he was intelligent, he believed in himself. Subject C also had an innate belief in himself but questioned how bright he was, as did Subject G, who, in spite of external assurances from family and back-handed compliments from his teachers, thought he had limited ability. Subjects D and F reported their teachers' reactions but not their own.

Subjects' Opinions On Why They Have Had School Difficulty - (Question 3 of the Interview)

Question 3: You have had difficulties in school. Why do you think you have had those difficulties?

Summary Descriptors B

Subject A:

Knew that he didn't know much in English or Social Studies but did not know why. When urged, said his difficulty was based on not studying very hard which he agreed may have been because of lack of interest.

Subject B:

Felt he did poorly in school because of a period of lack of discipline following his parents' divorce. He felt that his resistance to doing what he was told to do also contributed to his problems. He preferred athletics to books.

Subject C:

Reading problems were influential and he felt that he should take more time. He believed that if he put more effort into studying his grades would improve.

Subject D:

Teachers had told him that he didn't do well because he didn't care. He tended to agree. He also agreed that reading might be a factor because it took him so long to read but he did not bring up this possibility spontaneously. Whether or not he liked a subject was a factor in how well he did. Not an academic, he liked to work with his hands.

Subject E:

He felt that he had difficulty because of reading problems and hyperactivity.

Subject F:

He began by saying that he had no idea of why he had done poorly in school. He denied that reading could ever have been a problem but admitted that writing was a problem. Said he had to have heard material to remember it, that he coudn't remember what he reads. He couldn't study no matter how he tried. He was bothered as much by disinhibition as by distractions.

Subject G:

He believed his poor marks were due to the compulsory nature of school. (Said his teachers felt he should work harder; he didn't think that would help.)

Results of Question 3

All but two of the subjects could give quite spontaneous accounts of why they had not done well in school without additional prodding and all seven subjects did postulate as to why they had experienced learning difficulty. All but one subject (Subject G) looked inwards for the reason and tended to blame themselves for their school difficulty in some way or another. In all, eighteen reasons were given, with subjects offering from 2 to 5 reasons each as to why they had problems. The responses were classified into five types: don't know, attitude, academic, underlying skills and other (see Table 96). When viewed globally rather than by subject, the greatest number of reasons proferred in one category were in the area of attitude (6), with academic skills (5) and underlying skills (4) falling in second and third place in frequency hierarchy. However, when looking at the number of students making responses, the categories of attitude and academic skills were mentioned by the same number of students (4) and the most students. The three remaining categories had the same number of student responses each (2).

The single reason for school difficulty mentioned most frequently (3 times) was in the academic skills category; namely, reading. However, considering the degree of difficulty experienced by the

Table 97

Subjects' Opinions On Why They Have Had School Difficulty

		Attitude					Underlying Skills				Academic			Other	
Subject	Don't Know	More Effort	Not Studying	Not Interested	Doesn't Care	Resists	Hyper	Distract.	Lacks Concentration	Memory	Reading	Writing	Not Knowing Subj. Matter	Family	Nature of School
A	✓		✓	(✓)	✓								✓		
B						✓								✓	
C		✓									✓				
D					✓						(✓)				
E							✓				✓				
F	✓							✓	✓	✓		✓			
G															✓
	1/7	1/7	1/7	1/7	2/7	1/7	1/7	1/7	1/7	1/7	3/7	1/7	1/7	1/7	1/7
	2/19			6/19				4/19				5/19		2/19	
	2 students' responses included			4 students' responses included				2 students' responses included				4 students' responses included		2 students' responses included	

Circle means that subject agreed with suggestions of interviewer.

subjects used in the present study (see Table 6), one might have expected an even higher frequency of this response.

Although six of the seven subjects had some degree of inhibiting reading problem, only two spontaneously suggested that the deficit had contributed to school failure. A third agreed with the suggestion that such a disability may have contributed to his problems, while a fourth flatly refused to consider such a possibility although he agreed that poor writing skills were a problem. In short, four of the six subjects had not considered the link between their reading difficulty and their school failure to the extent that they would mention it spontaneously in an interview of this nature. None of the subjects brought forth any reason which might be described as a reference to poor organizational skills or strategy problems as a reason for poor marks. At this point in the interview no one mentioned failure to achieve as being dependent on low ability. It is possible that this profile was in part influenced by the previous assurance of adequate ability.

Subjects' Opinions of Why Some Students Do Well in School - (Question 5 of the Interview)

Question 5: Why do some people do well in school?

Summary Descriptors C

Subject A:

He felt students do well because they like the subject. (May have been influenced by examiner.)

Subject B:

May do well in a lot of subjects but may not do well in athletics. Achievement in school means that you can finish something you've started. (Not a direct answer.)

Subject C:

People do well in school because they take a lot of time and they work. Things come easier to those who do well.

Subject D:

Key to doing well is to like the subject; good academics care about marks and work to better themselves.

Subject E:

It comes to them easily and they are naturally smart.

Subject F:

Trying harder, luck of birth, and high IQ contribute to school success. People who keep thoughts in their heads easily do well.

Subject G:

Students do well because of their enjoyment of school, because they have plans and they want to get better marks than their friends.

Results of Question 5

The idea of good students having subject matter come easily to

Table 98

Summary of Opinions on Why Some Students Do Well in School

	Action			Ability			Attitude					
Subject	Plan	Work	Put In Time	Comes Easy	Keep Thoughts	IQ	Care	Want to be Better	Competitive	Resolute	Likes Subject	Enjoys School
A											✓	
B										✓		
C		✓	✓	✓								
D							✓	✓			✓	
E				✓								
F				✓	✓	✓						
G	✓								✓			✓
	1/7	1/7	1/7	3/7	1/7	1/7	1/7	1/7	1/7	1/7	2/7	1/7
		3/15			5/15				7/15			
	2 students' responses included			3 students' responses included					4 students' responses included			

Numerator: Number of students exhibiting the characteristic
Denominator: Total number of students

Numerator: Number of students in category
Denominator: Total number of opinions given

them was the most frequently given answer to the question, "Why do some people do well in school?" Three subjects of the seven gave answers of that nature; however, one of the three saw hard work and willingness to put in time as contributing factors as well.

When the ideas were grouped in three categories: action, ability, and attitude (see Table 97), the global approach once again showed that the greatest number of responses were in the attitude category (7), followed by ability (5) and then action (3). This hierarchy remained the same when viewing the number of students contributing suggestions in each category: 4, 3 and 2.

One subject suggested that the ability to plan contributed to school success.

Comparison of Responses On School Success and Academic Difficulty

The most frequently voiced single reason for not doing well in school was because of reading problems, while the most frequently suggested single reason why some students do well was that things came easily to them. Categorically, however, students' reasons for both achievement in others and lack of achievement for self were predominantly suggestions describing attitude. In outlining the reasons why people achieve success in school, numbers of students making responses were highest in the attitude category. When giving reasons for school failure, the same number of students contributed ideas which were categorized as attitude as gave responses which dealt with academic skills.

Subjects' Opinions on Experiences with Subject Areas in School - (Question 4 and 4a of the Interview)

Question 4: Were some subjects harder than others? If yes, which ones were the hardest and why?

Summary Descriptors D

Subject A:

Social Studies and English were most difficult. He had never liked or been interested in them. Chemistry was his favourite--interest based on liking chemicals. He found it easier to learn something he liked. He thought that everything was easier than Social Studies and English.

Subject B:

Didn't see some subjects as harder than others--it was usually that he wanted to do something else.

Subject E:

English hard. He felt he used to be good in Math but that the increased reading component had made it hard. Physical Education was easy. He hated Spelling and had hated it throughout his school career.

Subject F:

Did best in alternate courses.

Subject G:

Math and Science had been difficult. He could not remember Math--blamed science difficulties on a poor teacher. Math and Science were hard because of preconceptions and content.

Table 99

Positive and Negative Experiences with School Subjects

Subject	Hard	Easy or Liked
A	- Social Studies - English	Chemistry
B	none harder/easier	Depends on his involvement
C	- English - Language Arts	Science
D	- English - Psychology	Autobody Science Physical Education Outdoor Education
E	- English - Spelling	Physical Education
F	- Regular academic subjects	Alternate Courses
G	- Math - Science	None mentioned

Results of Questions 4 and 4a

Five of the seven subjects mentioned English as being a problem in some context of their school careers. The most commonly mentioned subject of interest or ease was Science with three students selecting some aspect of this subject to speak about in positive terms.

Subjects' Approaches to Studying for Exams - (Question 9 of the Interview)

Question 9: Suppose you have an exam tomorrow. Tell me what you would do to prepare for it.

Summary Descriptors E

Subject A:

(Examiner has feeling she is drawing out each thought.) Said he would study to prepare for exam. He would do this by reading books at home (but had no books for exam coming up in near future). He reported that he reads notes, writing down the main points, but does not talk out loud. He uses text, looking for important points. He felt that his most important strategy was to read notes. He said he uses his lab book in Chemistry. Subject A has family members question him about content. He always studies and studies harder for subjects he does not like.

Subject B:

Subject B equated memorizing stuff with preparing for exams. He outlined a strategy he used for remembering a series of points. He reads them over first and then he memorizes the first couple of letters of each point. He had used the technique in a psychology exam the previous week. He finds that relaxation helps his studying. He said that the number of repetitions used to commit material to memory varies with the scope or amount of material to be learned. He was not clear regarding the range of those repetitions. In speculation, he supposed one could effectively use syllables, suffixes, or prefixes to trigger memory. He also finds that objects or furnishings in the classroom stimulate his memory for things learned there. He never asks anyone to hold his book and ask him questions nor does he talk aloud to himself.

Subject C:

In preparing for exams, Subject C skims over the parts of his notes he knows well. However, parts he knows less well he would first clarify, expand, then read them a couple of times. Studying to him is sitting down and reading material. When first questioned about speaking aloud, he felt he did not use that study technique, saying he just thought the material over. However, when he talked about memorizing terms, he said he read the term several times, then left his notes, talked to himself and if what he said wasn't correct he would go over his notes again and then verbalize the material once more. He also reported taking notes when studying by pulling main points and using point form recordings.

Subject D:

Subject D began his comments on exams by saying that he had never studied hard for a test and wouldn't study hard for a test and would not study hard for English. The only thing he reported doing for English was to practise reading fast so he could get through the short stories which tended to make up the exams. For a tools exam (part of Autobody) he was reading over his text (primarily pictures) twice a night, nightly, during T.V. commercials. He also reads his text in Food Science. He never tries to tell himself material aloud but does read aloud. He had someone ask him questions in Math last year but was not employing this method at the time of the present study.

Subject E:

For the previous two years, Subject E had done nothing to prepare for examinations. Reviewing brought a nervousness that was debilitating in exams. Not studying brought him to the examination in a calmer state. At the time of the interview, however, he was going over his Biology notes for an upcoming exam. He felt he was doing very badly and wanted to "get" the subject. He was reading over his notes and redoing assignments as well as going through the textbook using both the pictures and the print (he had spoken earlier of his reliance on pictures when using textbooks). He reads over material and repeats it. His notes are usually obtained from a friend. He tries to listen carefully in class rather than take notes because concentrating on spelling hampers his ability to take notes. Although he has taped classes in the past (Grades 10 and 11), he feels self-conscious about taping and would feel more relaxed if he were not the only one taping.

Subject F:

Subject F would attempt to study his notes at home for an upcoming exam but he would be unable to concentrate and so he would not study. Even when alone, he does not work effectively. He never studies from his textbooks. He used to have someone ask him questions but doesn't anymore, even though he perceived it as being helpful. He reads aloud and questions himself, but in his attempts to talk to himself he is easily distracted by his own thoughts or perhaps the T.V. set. Even though his room is quiet he thinks about things in the room. He finds the school library noisy whether or not it is crowded. He felt the public library might be a place where he could be totally alone but felt sure that his mind would still wander. Although he can become totally absorbed in a T.V. show, he finds studying and all subjects boring. He said that he can concentrate on T.V. because he wants to concentrate. Even if he enjoys a particular class, he cannot study for it. He has never had any help in learning to study.

Subject G:

Subject G would study at home, sleeping and eating first, then reading and interpreting his notes. He concentrates on notes emphasized by the teacher. He reads part of the texts which are important. He said he didn't think he talked aloud when he studied but admitted that his mother often asked who he was talking to when he was working alone in his room. He practises equations in Math but initially did not remember doing any other writing even though his teachers encourage study notes. Later he said that he wrote out some difficult words after reading them and pronouncing the difficult part of the word in a literal phonetic manner.

Note: further questioning often prompted memories of employing a denied study strategy. These memories were also triggered by explaining specific aspects of preparations.

Results of Question 9

Three of the subjects made it clear that they did not engage in regular preparation for examinations. Subject D had never studied hard in the past but was selectively preparing at the time of the interview because of his desire to do well in autobody. Despite his minimal reading skills he was close to the top of his class in

Table 100

Summary of Students' Approaches to Studying for Exams

Subject	Redoing Assignments	Reads Text	Reads Notes	Reads Other Books	Reads Aloud	Talks Aloud	Writes Material	Another Questions	Picture	Other
A	(lab book)	(✓) looks for main points	Δ✓	✓	-	(no)	main points of notes	(✓)		
B	-	-	-	-	-	no	(✓)	no	-	memorizes first letter of points to be remembered
C	-	-	-skims well known -difficult parts clarified, expanded, gone over couple of times	-	terms from notes	Δ(no) terms from notes later	(✓) main points in point form	(no) not helpful	-	-
D	-	✓	-	-	✓	(no)	✓	(✓) in past not now	✓	practises reading fast
E	✓	✓	✓	-	-	(✓)	-	-	✓	-
F	-	(no)	(✓)	-	✓	(✓) tries--gets distracted questions himself	-	(✓) in past	-	-
G	✓	(*✓) important parts	(*✓) particularly parts emphasized by teacher		(no)	(✓) qualified	Δ(no) difficult words	-	-	interprets notes
	3/7Y	4/7Y	5/7Y	1/7	3/7Y	4/7	5/7	3/7Y	2/7Y	
	0/7N	1/7N	0/7N	0/7	1/7N	3/7	0/7	2/7N	0/7	
	4/7NM	2/7NM	2/7NM	6/7NM	3/7NM	0/7NM	2/7NM	2/7NM	5/7NM	

Δlater gave conflicting information; counted as positive response.

Circle: direct response to E's questions. Points triggered by E but not a direct response to E are not circled (not verbatim)
Those included: Do you use your notebook or textbook? Do you write? Do you include only the important points?

Y: Yes N: No NM: Not mentioned Numerators: Number of students fitting the category Denominators: Total number of students autobody. Subject E had opted out of studying because of the extreme nervousness it created in him. He had for two years found he was calmer going into an exam without having done any preparation than he was attempting to learn material. A dyslexic whose difficulties extended to all symbol systems, Subject E was at the time of the interview breaking his never-study rule in order to prepare for Biology, a subject which was crucial in his career aspirations. Subject F usually attempted to study but found that his thoughts and the environment impinged on his concentration until he gave up.

Overall, most of the subjects seemed to know many of the things to do when studying (see Table 100) although the efficiency of their approaches might be questioned. Subject D utilized his text but only devoted time while commercials were on T.V. Subject C did not want to engage in being questioned about exam material as he did not want to face knowing what he did not know. He saw no positive offshoots of such information. Subject B appeared much more interested in the process of retaining than understanding content.

None of the subjects gave the impression that they studied fervently. Of the seven subjects, Subject C's description included the most specifics, giving the impression that he had a fairly established routine in approaching examinations.

The most frequently employed tactics were writing out material in one form or another and reading classroom notes (five out of seven students). The next most frequently utilized study techniques were reading texts and talking aloud (four out of seven).

Subjects discussed a total of four kinds of monitoring strategies which they utilized: redoing assignments, talking aloud, writing out material, and having another person question them. Only one subject limited himself to one strategy while two subjects employed three separate strategies (see Table 101). The remaining subjects used two strategies.

Table 101

Number of Monitoring Strategies Used by Subjects During Exam Preparations

Subject	Number of Strategies
A	3
B	1
C	2
D	2
E	2
F	2
G	3

Results of the Analysis Described in Steps Six Through Nine

Data from the Interview Regarding Study Habits from Questions 3, 4, 6, 7 and 9 were interrogated according to Steps Six through Nine of the procedure for data analysis described earlier in the present chapter. Labelling of themes into the appropriate classifications and categories was done and a summary of the quantified data as it describes those areas is found in Table 102.

When interrogating the data from the viewpoint of "knowledge of" versus "regulatory" themes, it becomes apparent that all subjects made more "knowledge of" statements than "regulatory" statements when the total number of themes are examined (see Table 102). This pattern changes little when all statements prompted by the examiner are removed from the data. In examining spontaneous statements only, it is seen that Subject C's themes were labelled "regulatory" with equal frequency to being described as "knowledge of" statements (see Table 102).

When the data is viewed somewhat more closely by expanding the "knowledge of" category to specific and general subcategories and comparing them to the number of regulatory themes, a somewhat different pattern is seen. In this instance there are three divisions to examine across total and spontaneous groupings (see Table 103). When viewing the total themes, two subjects, Subjects B and C, have more "regulatory" statements than any other. This pattern does not change when only spontaneous themes are grouped; the same two subjects have the highest number of themes classified as "regulatory." The same consistency in subjects whose themes were assigned general "knowledge of" labels more frequently than other descriptors is seen from the total to spontaneous categories.

Subjects A, E and F made statements which tended to be general in nature (see Table 103). Subject F also retained the same classification across categories. In his case, his themes had equal numbers of specific and general "knowledge of" descriptors. Only

Table 102

A Comparison of the Number of Total and Spontaneous Themes in "Knowledge of" and "Regulatory" Classifications Derived from the Interview Regarding Study Habits Data

	Knowledge of		Regulatory	
Subject	Total	Spontaneous	Total	Spontaneous
A	㉙	$\boxed{17}$	8	5
B	⑱	$\boxed{15}$	12	12
C	⑫	$\boxed{8}$	9	$\boxed{8}$
D	㉒	$\boxed{19}$	2	2
E	㉔	$\boxed{22}$	3	3
F	㉖	$\boxed{18}$	3	3
G	⑯	$\boxed{14}$	3	1

Circled number is the category with the highest number of total themes.
Squared number is the category with the highest number of spontaneous themes.

Subject D's classification changed from category to category. He made the same number of general and specific "knowledge of" statements when his total theme production is examined. However, when only his spontaneous verbalizations are considered, he makes more specific "knowledge of" statements than any other kind.

Classifications across total and spontaneous categories are also quite stable when viewing the data in terms of types of expressions used least (see Table 103). In both categories, Subjects D, E, F and

Table 103

Numbers of Statements Reflecting 'Knowledge Of' and 'Regulatory' Functions from Questions 3, 4, 6, 7 and 9 of the Interview of Study Habits

	Knowledge Of							Regulatory				Total			
	General			Specific											
Subject	Spon	Prom	Total	Spon	Prom	Total	Lack	Spon	Prom	Total	Lack	Spon	Prom	Lack	Overall
A	13	7	(20)	4	5	(9)	1	5	3	(8)	1	22	15	2	39
B	8	1	(9)	7	2	(9)	0	12	0	(12)	0	27	3	0	30
C	2	2	(4)	6	2	(8)	0	8	1	(9)	0	16	5	0	21
D	9	2	(11)	10	1	(11)	0	2	0	(2)	0	21	3	0	24
E	12	1	(13)	10	1	(11)	0	3	0	(3)	0	25	2	0	27
F	9	4	(13)	9	4	(13)	2	3	0	(3)	0	21	8	2	31
G	8	2	(10)	6	0	(6)	0	1	2	(3)	1	15	4	1	20

Abbreviations: Spon: Spontaneous
Prom: Prompted

G make fewer "regulatory" statements than other classifications and Subject C makes fewer general "knowledge of" statements. Subject B's spontaneous themes were classified as specific "knowledge of" fewer times than any other classification while, when his total number of themes were considered, both specific and general labels were ascribed equally and less often than "regulatory" labels. Subject A presents a very idiosyncratic picture. In his case there is a considerable difference betwen the total and spontaneous categories, the first being "regulatory" as the least used type of verbalization and the second being specific "knowledge of" statements.

Overall, subjects tended to use general "knowledge of" statements most frequently and "regulatory" statements least often (see Table 104). Comparisons across total and spontaneous categories differed with only one subject when comparing most frequently assigned labels and with two subjects when viewing the data in terms of least used descriptors.

Ranking of the three classifications of specific "knowledge of," general "knowledge of," and "regulatory" across total spontaneous categories allowed a further examination of the constancy of performance and the effect of examiner prompts on the verbalizations. Table 105 shows the results of these rankings as well as the ascribed labels of constant, similar or differing.

The data for four subjects (Subjects C, E, F and G) showed constant rankings. Subjects B and D had similar rankings. In these cases, identical scores on two classifications were made. Subject A was again idiosyncratic, with themes ranked in differing order from total to spontaneous classifications.

Table 104

A Comparison of Highest and Lowest Numbers of Total and Spontaneous Themes in "General Knowledge Of," "Specific Knowledge Of" and "Regulatory" Classifications Derived from the Interview Regarding Study Habits Data

Subject or Category	Highest Total	Highest Spontaneous	Lowest Total	Lowest Spontaneous
A	General	General	Regulatory	Regulatory
B	Regulatory	Regulatory	* General/ Specific	Specific
C	Regulatory	Regulatory	General	General
D	* General/ Specific	Specific	Regulatory	Regulatory
E	General	General	Regulatory	Regulatory
F	* General/ Specific	* General/ Specific	Regulatory	Regulatory
G	General	General	Regulatory	Regulatory
Specific	0	1	0	2
General	3	3	1	1
General/ Specific	2	1	1	0
Regulatory	2	2	5	4

*Equal numbers of general and specific "knowledge of" statements.

Table 105

A Comparison of Rankings of "Specific Knowledge of," "General Knowledge of" and "Regulatory" Classifications on Total and Spontaneous Categories in the Interview Regarding Study Habits

	General Knowledge of		Specific Knowledge of		Regulatory		
Subject	Total	Spon	Total	Spon	Total	Spon	Comparison
A	①	$\boxed{1}$	2	$\underline{3}$	$\underset{\smile}{3}$	2	differing
B	2	2	2	$\underline{3}$	①	$\boxed{1}$	similar
C	$\underset{\smile}{3}$	$\underline{3}$	2	2	①	$\boxed{1}$	constant
D	①	2	①	$\boxed{1}$	$\underset{\smile}{3}$	$\underline{3}$	similar
E	①	$\boxed{1}$	2	2	$\underset{\smile}{3}$	$\underline{3}$	constant
F	①	$\boxed{2}$	①	$\boxed{2}$	$\underset{\smile}{3}$	$\underline{3}$	constant
G	①	$\boxed{1}$	2	2	$\underset{\smile}{3}$	$\underline{3}$	constant

Circled figures represent first ranked in total themes.

Squared figures represent first ranked in spontaneous themes.

Curved line underlinings represent last ranked in total themes.

Straight line underlinings represent last ranked in spontaneous themes.

Abbreviation: Spon = Spontaneous

SUMMARY OF RESULTS

Throughout the Results chapter, summary sections have been inserted to help to focus the outcomes of the data analysis. Highlights of the major trends will be outlined again here. These results are meant to be descriptive rather than conclusive.

In the present study, rankings on achievement, language, and processing skills were compared with one another and with the order in which teachers had ranked the subjects' organizational skill ratings on the Questionnaire on Organization Skills. Five of seven subjects received equal or similar rankings in organizational ratings and Performance IQ as well as organizational ratings and lowest academic mark.

While all subjects were found to be strategy absent in the Rods Task, it was obvious that they learned about the requirements of the task and the variables involved by manipulating the materials. However, three subjects were unable to regulate their actions by their knowledge on the Rods Task. For those three subjects the same problem with application of knowledge was evident on the Text Search Task.

The Self-Ordered Task revealed that four of seven subjects had mean error scores exceeding the total mean errors of one or more of the normative brain damaged groups. While there was not a perfect relationship between increasing speed and increasing error count, in general it may be said that those who worked more slowly on the Self-Ordered Task also worked more efficiently. When Self-Ordered Task error (SOTE) rankings were compared with the rankings of other measures used in the present study, it was found that five out of seven subjects had equal or similar rankings on SOTE and teacher ratings on the Questionnaire on Organization Skills. There was no correspondence between those who did poorly on the Self-Ordered Task and those who could not regulate their behaviour on the Rods Task and Text Search Task.

Results of the analysis of student responses to the Questionnaire on Organizational Skills indicated that in general, subjects saw themselves as being more organized than disorganized. An examination of subject ratings on specific organization skills revealed that the three subjects who rated themselves lowest in Regulation were the same three subjects who could not regulate their task behaviour on the Rods and Text Search tasks.

When teacher and subject ratings on specific organizational skills from the Questionnaire on Organizational Skills were compared, it was found that, in general, teachers in less academic settings were more likely to have ranked organizational skills in the same way that the subjects had rated themselves, when areas of lowest ratings were compared. Only one teacher in an academic setting ranked a subject as lowest in the same area in which the subject's responses had been least positive. The single skill most frequently rated as low, by both subjects and teachers, was Verification. Highest rankings by teachers comparable to highest rankings by students were more equally distributed between teachers in academic and less academic settings with three equivalent lowest ratings for each group. General Organization skills were ranked highest most frequently.

There appeared to be differences in the ways teachers in academic settings and less academic settings perceived the same student. Academic teachers tended to classify students as disorganized and saw students as engaging less often in specifically described organizational behaviours. Teachers in less academic settings tended to classify students as organized and saw students as engaging more often in specifically described organizational behaviour.

The spontaneous responses made by subjects during the Questionnaire on Organizational Skills were analyzed into operationally defined categories of words, comments and elaborations. The qualifiers, precise and general, were also attributed to the verbalizations. Most subjects responded using comments (i.e., unitary ideas expressed in one phrase or in a single statement). The comments were largely general (i.e., a comment which gave only a general idea of an action or understanding and might, because of its generality, have left the reader less assured of having read a true reported action). Only two subjects used precise elaborations spontaneously. The transcripts of these subjects gave the reader a clear idea of a specific action or understanding and a sense that the subject was describing what he actually would do.

In examining the percentage of spontaneous responses made by subjects on the Questionnaire on Organizational Skills, it was apparent that the two subjects in the study who might be termed culturally different were ranked lowest and second lowest. Indeed, when all of their verbalizations were considered, it was found that they were most likely to use single word responses, often simply agreeing with, disagreeing with or parroting, in part, the examiner's statements.

Transcripts from the Interview Regarding Study Habits were analyzed to see what subjects' verbalizations revealed about their knowledge of their study habits (statements which reflected conscious access to knowledge) and what their replies indicated regarding their knowledge of their regulations of their approaches to study (statements which reflected elements of planning, monitoring and checking outcomes). When "knowledge of" statements were compared to "regulatory" statements, it was noted that all subjects had made more "knowledge of" statements. However, when three categories were formed by dividing "knowledge of" statements into specific and general classifications, a different pattern emerged, with two subjects' verbalizations revealing more statements reflective of their regulation of their study habits than of their "knowledge of" their approach to studying.

When, during the Interview Regarding Study Habits, subjects were asked why they had school difficulty, all but one subject looked inward for reasons. Classifying those reasons into five types yielded a pattern of more "attitude" responses than any other. Only one subject spontaneously mentioned reading as a probable reason for school difficulty despite the fact that six of the subjects had experienced marked reading problems throughout their school careers.

When asked the general question "Why do some people do well in school?", subjects once again most frequently gave explanations which were classified as "attitude" responses. The most commonly used single response, however, was an "ability" response, namely, that people do well because work comes easily to them.

In Chapter V, the trends from the analysis of subjects' responses and behaviours (on four tasks and thirty-one metacognitive questions) have been described. In the following chapter, patterns seen in individual subjects on those same elements are investigated and related to information gathered regarding intellectual ability as well as academic and processing skills. These Case-Studies may be seen as foundational work in the search for subgroup characteristics present in students with poor organization skills.

THE UNIVERSITY OF ALBERTA

A STUDY OF STRATEGY USE, STRATEGY VARIATION AND STRATEGY ABSENCE IN THE TASK APPROACH OF LEARNING DISABLED ADOLESCENTS WITH ORGANIZATIONAL PROBLEMS

BY

(C) GLADENE ROBERTSON

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CHAPTER VI

CASE STUDIES

Chapter Six of the present study is comprised of seven case studies each of which has been developed around the following seven elements:

1. The academic and processing skills assessment
2. The Rods Task results
3. The Text Search Task results
4. The Errand Planning Task results
5. The Self-Ordered Task results
6. The Interview Regarding Study Habits
7. The Questionnaire on Organizational Skills.

CASE STUDY BASED ON DATA COLLECTED FROM SUBJECT A

The Academic And Processing Skills Assessment--Subject A

Subject A was sixteen years one month old during the initial data gathering and sixteen years eight months of age during his final involvement with the present study. When he joined the study, he was in Grade 10 and carrying eight subjects, five of which were academic. His overall academic average just prior to the initial data gathering was 48.5 percent with a range from 15 to 70 percent. His highest academic mark was in Biology and was 63 percent.

If Subject A's individual test scores, done for the purposes of the present study, were approached in a cursory fashion, there would be little to indicate why he was failing so badly in school. He was of average intelligence, his reading skills were relatively high and his vocabulary in formal structured settings was impressive. Despite these skills, his academic average the previous term had been below 50 percent.

Looking more closely at his standardized test results, there were, first of all, a number of dichotomous factors in his profile. For example, although his verbal intelligence was the highest of the two scales and his reading scores were above grade level, his lowest marks were in Social Studies and English. His mark in each of these subjects was 15 percent. Conversely, although his WAIS-R scaled score in Arithmetic was 7 and his WRAT score in Mathematics was at the 7th percentile (timed) and 23rd percentile (untimed) as compared with the 99th percentile in WRAT Reading subtest, he was passing his Math. There was an inverse relationship between his achievement in basic skills, as measured by standard tests, and his school performance.

His memory scores were variant and again had an interesting twist given his measured quantitative and verbal skills. For example, his digit span score on the WAIS-R was a relative strength when compared to his own mean. He obtained a scaled score mark of 11. His memory for words, however, was less impressive than his memory for numbers, with Detroit scores for related syllables (or meaningful sentences) at an age score of 8 years 0 months and his age score for unrelated words at 8 years 8 months. He also found it hard to recall details from a spoken paragraph on the CELF.

Subject A appeared to have a number of subtle language difficulties which did not always manifest themselves in formal test results. For instance, he obtained an average score in Vocabulary on the WAIS-R and a score one standard deviation above the mean in Morphological Competency on the Fullerton. Also, in speaking with him, the examiner was impressed with the quality and choice of his lexicon. It should be stressed, however, that this advanced display was in formal testing situations only. He used very little spontaneous or interactive speech on other occasions. Even the transcriptions from the language he used when completing the tasks revealed terse, unelaborated expression.

His most obvious language difficulties, as revealed by the assessment, lay in trying to find and explain absurdities on the Verbal Absurdities subtest of the Detroit Tests of Learning Aptitude and in explaining idioms on the Fullerton Test of Adolescent Language. For example, when asked what was foolish about the sentence "My sister has a beautiful ring which our mother gave her five hundred years ago" (Baker and Leland, 1967), he replied that a ring couldn't last five hundred years. When asked what was foolish about "I knew my father had walked all the way from Europe because his shoes were covered with mud" (Baker and Leland, 1967), he said that people didn't usually walk long distances when their shoes were covered with mud. He interpreted many of the idioms which he attempted either literally or erroneously. He said that "put your cards on the table" meant to "gamble" and to "see eye to eye" meant to "imagine." Often he did not volunteer an explanation and simply said "don't know."

Informally, the examiner felt that Subject A often missed the point of an explanation. Formal testing indicated receptive skills to be lower than expressive ones. For example, his overall processing score on the CELF was at the 35th percentile while his production percentile score was 65. The three subtests of the CELF which were below criterion were Word and Sentence Structure, Linguistic Concepts and Spoken Paragraphs. In the Processing Word and Sentence subtest, he failed both items involving negation and made further errors in verb phrase tense, a personal pronoun and a relative clause. In the latter three error classifications, he passed two or three other items in the same class. All of his errors in Linguistic Concepts indicated difficulty in understanding temporal concepts.

As mentioned previously, Subject A was unable to explain the meanings of idioms as they were presented on the Fullerton. He also had a score of more than two standard deviations below the mean on another Fullerton subtest, that of Divergent Production. Here he was asked to name as many items as possible that might fall into a specified category ~~within a~~ twenty-second time frame. There was some question of Subject A's ability to clearly discriminate auditorially. However, dialectical differences may well have accounted for the problem. The issue of cultural difference was addressed initially when Subject A was considered for the study. Since he was raised in Britain or other Commonwealth countries in which English was the principal language spoken, it was thought that cultural difference was not marked enough to warrant not including him in the study.

Subject A was born in England and lived the first nine years of his life there, when he moved to the Caribbean. At fifteen, he immigrated with his mother to Canada where he enrolled in the school eight months before the present study was conducted. While there was little information in his cumulative folder, interviews with the resource teacher revealed many more reasons for including than excluding him from the study. He was truly a "puzzle child" to his teachers; that is, he seemed to have ability which he could not apply to school tasks. He was not belligerent or overtly uncooperative, yet he did not do well in academic endeavours. Notes in his records included the following phrases: poor communication; disorganized; unable to accomplish independently; doesn't follow instructions; quiet--uncomfortable when spoken to; organizational problem.

He was rated as disorganized on the twenty-point questionnaire by both of his raters, an English teacher and the Learning Assistance teacher. His English teacher noted that he rarely completed an assignment despite his oral reading skills. Subject A received the lowest ratings by both his academic and nonacademic teachers as compared to other subjects in the study.

The Rods Task--Subject A

Sequentially, the subtask sequence of the Rods Task moved from Free Performance 1, or Trial 1; to Pairs Choice; to Free Performance 2, or Trial 2; to Final Choice; and then to Independent Test.

Following the task, metacognitive questions were asked. Before the experiment began, and after it was concluded, subjects were asked to name things which they thought mattered for bending.

Free Performance One

Subject A was unable to use a control-of-variables strategy in his first Free Performance trial. He tested for three of the expected variables: length, base and material, through eight tests. Of those tests, he made what might have been termed an unconfounded test of the variable base. However, as none of his verbalizations indicated that he recognized that he was testing for base, it was not accepted as test of the variable. In this case, he talked about the fact that the rods were of the same material and length and acknowledged that they bent in the same manner. He did not mention the one variation in the rods which did exist.

In repeatedly answering the question "Why did you choose those two?", asked as his pairs were placed in the stand, he initially responded in a very general way (see Table 106, items 1 and 2). A more pointed question from the examiner on test 2 brought a more specific response for tests 3, 4 and 5; however, he lapsed into general statements again for tests 6 and 7. Once again the examiner probed for more detail on test 7 and Subject A obliged for items 7 and 8. However, even when he added some detail, his descriptors were terse.

In answering the question "What did you find out?" once he had completed the experiment, he gave a succinct comment regarding which rod bent the most. Only once, in test 4, did he comment comparatively in a manner which gave no conclusion.

Table 106

Free Performance One On The Rods Task--Subject A

Test	Response to question: "Why did you choose those two?"	Response to question: "What did you find out?"
1	Because I wanted to see which one is bendable.	The long one bends more.
2(a)	Because I wanted to see which one is more bendable.	
2(b)	(following examiner's question) Because they are both glass.	They are going to bend the same way and they're the same length.
3	I wanted to see which would bend more - this stick and the metal.	The stick bends.
4	I wanted to see which would bend more between this metal and the glass.	(a) Plastic is softer. (b) (following examiner's question) Plastic bends more than metal.
5	To see which one would bend more out of these two metals.	The long one bends more.
6	To see which one would bend more.	They bend the same.
7(a)	To see which one would bend more.	
7(b)	I think this long one's going to bend.	The long one bends more.
8	Because I wanted to see which would bend more and this plastic and this wood one.	Plastic bends more.

Pairs Choice

Subject A reached a level of 80 percent accuracy on his pairs choice. This element of the task involved judging the better or unconfounded test from the two tests presented to him. Of five trials he was successful on four. His reasons for making his choices were again terse and two of the five statements he made were confusing. For example, in the third choice he needed to choose between a confounded and unconfounded test of material. He correctly chose the unconfounded pair but said he had made the choice because the rods were long and could bend more. The confounding variable had been diameter. His reason was an irrelevancy.

Free Performance Two

Subject A was again unable to use the control-of-variables strategy. He mentioned three of the five demonstrated strategies from the elicitation phase of the pairs choice: thickness, length and substance. In the first Free Performance Trial he had tested for length, material and base. He made only one unconfounded test on the second Free Performance Trial, one of thickness.

Final Choice

In the final choice phase, Subject A made no errors. He answered "yes" or "no" correctly to five questions which asked him to judge whether the examiner-displayed set of rods was a good test of a specified variable. His answers were appropriate and showed understanding of the processes involved. For example, he identified a confounded test (by diameter) of material by saying that it was not a good test because "the wood is thicker than a glass." He also indicated that he recognized an unconfounded test of length by saying it was a good test "because they're both the same substance and the same thickness."

Independent Test

When asked to construct a test of his own to show one thing which mattered for bending, he was unable to do so. His Independent Test was a test of thickness which he confounded with using rods of differing material.

Metacognition

Prior to the first Free Performance Trial, Subject A could name only one possible variable which made a difference for bending, the dimension of length. Following the Independent Test, he named four of the five demonstrated variables. The variables were those he had tested for in both his Free Performance Trials: length, thickness, substance and materials.

When asked if he changed his mind from his initial position or if he had learned anything from doing the experiments, he simply stated that he had learned something. When pressed, he parroted his own response to the preceding question regarding what made a difference for bending. From the beginning to the end of the Rods Task, Subject A did not appear to link his actions to a learning process.

Text Search Task--Subject A

The Text Search Task was divided into three parts. The first part consisted of an introduction of the materials, a demonstration of the principal features of the text (without prescribing their use) and an open-ended instruction to find the answer to a specific question. The second part was an elicitation phase which consisted of a three-part demonstration of text search strategies of varying efficiencies from which subjects were to select the best approach. The third part of the session was another open-ended question which permitted subjects to demonstrate any changes in strategy use.

Trial One

Subject A was the only subject in the present study who on Trial One was actually not able to find a section of the text which would give him the information which he wanted. He used a type 2 strategy initially, meaning that he utilized the table of contents. However, he stopped at the first occurrence of the appropriate key word, not taking into consideration the detail of the question posed to him. He turned to the initial page of the inappropriate chapter and then paged randomly using pictorial clues primarily. This in itself was of interest given his more than adequate reading skills. As it became apparent that he was not being successful, his search techniques became even more random as he flipped back and forth through the pages. He made no attempt to use the table of contents again and seemed quite helpless. The examiner urged Subject A several times to verbalize his actions. Just before he gave up he said:

Subject A: I'm looking for it in the book and I can't find it so I'm turning the pages to see if I can find it. [Pause] I don't see it.

Demonstrations

When asked to select from the demonstrated approaches of locating the answers to two other questions, Subject A chose the most efficient strategy for both demonstrations. In each case when asked why he made the choice he did, he gave plausible but terse explanations.

Demo 1

Examiner: Okay, which was the best of those three methods, ____________?

Subject A: The last one.

Examiner: Why?

Subject A: Because it has a glossary so that you can (mumble) any words you want to find out - know about - you can look up the page.

Examiner: Okay.

Subject A: Look it up.

Examiner: So, why is it the best method? You can look it up and . .

Subject A: It's the easiest way of finding it.

Demo 2

Examiner: Which was the best of those three methods for finding out what this text tells us about algae?

Subject A: The last one.

Examiner: Why?

Subject A: Because it would be easier to find the - what you're looking for in the glossary.

Examiner: When you say easier, what do you mean by that?

Subject A: Because it is arranged alphabetically so that you find it quickly.

In this task, as with other aspects of the present study, the examiner had to be very careful that her probes did not cause Subject A to try to tailor his remarks to meet what he interpreted as her expectations. Early on in the task, encouragement was given to Subject A to verbalize more. It was the examiner's feeling that her remarks caused Subject A to become more submissive but not necessarily more verbal.

Trial Two

Subject A once again employed a type 2 strategy on the second trial and as in Trial One he was unable to find the answer to the question. At that point he was classified as strategy absent but a further intervention was attempted to ascertain if additional probing would help him to be successful. The examiner first assured Subject A that the answer was in the book and asked an intervention question: "Can you think of another way you might find it?" Although he immediately responded "the glossary," it required another twelve questions or intervening statements before he was able to utilize the index. The portion of the Text Search Transcript revealing his task approach is found below:

Examiner: All right. I've got one more for you to do, ____________. Would you please tell me what this text says about early kinds of communications - about early kinds of communications? Would you show and tell me how you would find out about that - early kinds of communication?

Subject A: I would look at the Contents - and see if it was there - and then I see Types of - of Communication, page 159, and then I turn there - and then I look to see if I can see it - and then I find what I want.

Examiner: What do you want?

Subject A: Early kinds of communication.

Examiner: And have you found it?

Subject A: No. (Long pause) It's not there.

Examiner: Is not there?

Subject A: No.

Examiner: I think it is. Can you think of another way you might find it?

Subject A: Yeah.

Examiner: What?

Subject A: Look in the glossary.

Examiner: What are you looking up, ___________?

Subject A: Many early kinds of communications - and I found it.

Examiner: What are you looking for now? What do you have open in front of you?

Subject A: The glossary.

Examiner: Yes, and what are the words that are on that page?

Subject A: Different words.

Examiner: Mmhmm. Read some of them. Remember you're telling me what you are thinking.

Subject A: [Begins reading verbatim words and their meanings.]

Examiner: Okay. You don't have to read me the glossary but just a few words that you see there.

Subject A: I see eggs and Einstein [reads further headings].

Examiner: And what is that you are looking for?

Subject A: Early kinds of communications.

Examiner: So, what are you looking under? What are you looking for in the glossary? Tell me what you are looking for.

Subject A: Early kin - early . .

Examiner: K.

Subject A: Then I go to [turns back] communications. And I see communications - early kinds of communications - here on 60 - and I look for it - and found it.

Examiner: What does the heading on that page say, __________?

Subject A: The beginnings of modern communications.

Examiner: Mhm - that's very good. Okay.

Metacognition

In comparing his own initial use of the table of contents combined with the random flipping technique he used in Trial One to his guided use of the index in Trial Two, Subject A admitted that the second way was better but found it difficult to state a reason why it was better. Finally he said that it was better because it was quicker. He stated that the thing he had learned from the task was that "it's easier to find things out in the glossary than in the contents."

In summary, Subject A, as a Strategy Absent individual on the Text Search Task, seemed to know what he had learned but did not go about regulating his behaviour according to his new-found knowledge. Although he accurately judged the actions of the examiner with that knowledge in mind, he could not seem to employ that information when subsequently trying the task again. Following his lack of implementation, however, he verbalized that use of the index, or glossary as he called it, was preferred and that what he had learned was that it was easier to find things when employing the index. He stated the latter information in a manner which compared the index and table of contents.

The Errand Planning Task--Subject A

In the Errand Planning Task, the subject was essentially required to organize a list of errands. He was to decide which errands he would do, the times at which he would do them, and how he would get around from errand to errand. Sequentially, the subtest sequence was a Free Performance step in which he was given two opportunities, Trial 1 and Trial 2, to plan and verbalize his strategy; a series of three pairs of scenarios which he had to judge as to their relative efficiency; and another Free Performance Trial, or Trial 3. Following the task, metacognitive questions were asked. Trials were compared by examining student references to movement, time, and errands, and, for that reason, the discussions will be in terms of those three elements rather than a sequential description of performance of the task elements.

Introduction

Subject A's approach to the Errand Planning Task was markedly different from any other subject of the present study. This difference was seen across all elements of the task. It should be noted that the format of the task presentation was also different in Subject A's case. That is, he did Trial One followed by an elicitation and what was for other subjects Trial Three. He was not given two trials prior to the elicitation. It is unlikely, however, that this difference accounts for the pattern seen in Subject A's approach as it was idiosyncratic from the beginning and remains so even when his second trial after elicitation is compared with the second trial of other subjects done prior to elicitation rather than with their third trial.

Movement

Subject A's references to movement were specific in all cases in the first trial while 80 percent of his references were specific in the second trial. By specific it is meant that he told how he would travel rather than use words such as "go" or "come." Subject A's specific references declined from trial to trial. All his specific references in both trials were to the bus. He made no comments regarding walking or riding his bike, for instance. His reason for choosing the bus was that it was the fastest means of moving around. The average number of references for movement made by the subjects of the present study on Trial 1 was 16.71, compared to 6 by Subject A, and 12.57 for Trial 3, where Subject A made only 5 references. Eliciting showed no increase in number of references or specificity of the references he made.

Demonstrations

In choosing the better of two plans, Subject A made the wrong choice in the first demonstration and the correct choice on the second demonstration, but seemed to base his decisions on whether or not taking the bus or walking was involved. This reasoning served him well in the second demonstration, where it was part of a logical approach to differentiating between the two tasks, but was not at all appropriate in the first instance where, elements of time and efficient clustering of events were ignored.

On the third demonstration, he chose the less efficient scenario and, when asked to explain his choice, he repeated the scenario, giving no evaluative comments or elaborative explanations other than prefacing his description by saying, "It would be a lot easier . . ." He had been unable to give any reason initially and proferred this one only after hearing the scenario read again. Subject A's difficulty with judging the demonstrations is even more interesting when it is noted that all other subjects in the present study accurately chose the most efficient demonstration in every case.

Time

Subject A made no references to time in the first trial and four references in the second trial. Time was an important element in his reasoning in Trial 1, however, because it affected his choice of the number of errands he did.

Examiner:	All right, do you think you've done all the errands?
Subject A:	No.
Examiner:	Did you leave some out?
Subject A:	Yeah.
Examiner:	Why?
Subject A:	Because I couldn't do all the things at once and then I wouldn't have time.

In examining his performance, one sees that Subject A had done only four of the thirteen errands, omitting nine. The next highest number omitted by other subjects on Trial 1 was two, indicating that others managed to schedule the errands into the time frame quite easily, while Subject A could not or did not include even one third of the tasks.

Besides his difficulty scheduling, Subject A's poor concept of time was also evident in the first demonstration when he elected, as the most efficient plan, one which would take him by bus directly from school at 1:30 p.m. to the dentist's office where his appointment was not scheduled until 4:30 p.m. He did not seem to be aware of the fact that he would be sitting without accomplishing any of his errands for a period of in excess of two and one-half hours. He had elected the poorest scenario because, as he said in reference to the preferred scenario, "it would take longer to reach home when you're walking after you leave the bicycle at the repair shop." In this he was referring to a walk of some three blocks by the longest possible route.

Subject A used four specific time references in the trial following the demonstrations, which indicates that some elicitation may have occurred in terms of such references. He did only two trials, however, so in his case it is not possible to differentiate between the effect of the demonstrations and the influence of simply doing the task again.

The range of his time references was nine hours, two in the early part of the day and two in the evening. The importance of Subject A's time references is more fully understood when viewed in terms of the number of errands he accomplished. In the first trial, he did four errands and made no references to time. After elicitation he outlined a plan where once again he did only four errands but he had a time reference for every errand.

Errands

As may be evident from earlier discussions, Subject A did very few errands and did no more on his second trial following demonstrations than he did initially. Following Trial 1 he indicated that he felt that he had done all the errands he could in the time he had. This conception was seemingly not altered during the course of the experiment.

Metacognition

Subject A seemed quite unaware of the purpose of the Errand Planning Task or what he had learned by doing it. His comments were vague. He used partial sentences at times and seemed at a loss as to what to say when questioned about the task.

Examiner: What makes a good plan? (Pause) Do you think . .

Subject A: Thinking.

Examiner: I'd like you, if you can, to compare what you did in your first plan with what you did in the last plan. Tell me if you think there was a difference.

Subject A: Yah.

Examiner: What was the difference?

Subject A: I don't know if there was much difference (pause) the first one (pause)

Examiner: O.K. Which do you think was your best one? Your first one or your last one?

Subject A: The last one.

Examiner: Why?

Subject A: 'Twould be - 'Twould be a lot easier to go to the library to give the books - my books to the library and then take the bus and go to the restaurant and buy the food and then go to my house - then I'd take the bus from my house and leave and go to the party.

Here he did not tell why the plan was better but simply repeated what he had done.

When asked what he had learned about planning, he said, "Planning is important." When asked why, he said, "you need it for mobility." His reply to being asked why he thought his plan was good was very interesting given that he had made no attempt to do about two thirds of the errands. He said, "So that ah - could get everything in order."

General Comments

Subject A showed no overt organizational strategies as he worked. He did not refer to the written scenario or check off errands as he completed them. When he first heard the scenario, he appeared to stare at the map but during the reading in the second trial he "fiddled" with the microphone. He seemed to use little reasoning other than the fact that buses were faster than walking. He did not appear to know what he had learned and, with the exception of incorporating more mention of time, did not seem to profit from the demonstration.

Subject A used very few gestures although he was frequently reminded to "show" as well as "tell" what he was doing. When he did use his hands, he tended to move them along over the surface of the map, pointing to places he made reference to rather than touching the map.

Subject A thought for almost two and one-half minutes before he began to plan. That period contained verbalizations from the examiner which attempted to ensure that he understood the task and to assure him that his words would be accepted. He began his final plan after only eleven seconds.

The Self-Ordered Task--Subject A

The Self-Ordered Task consisted of organizing and carrying out a series of pointing responses. Each subject was required to touch pictures in a sequence according to a plan which he initiated and monitored. There was a high nonverbal visual memory component in the task.

Subject A worked quickly through the Self-Ordered Task. He ranked second in all but one of the sets in speed of completion. He did not take appreciably more time for each increase in difficulty, completing the set of 12 items in just 10 seconds more than his first set of 6 items, and taking even less time to do the set of 12 than he did the set of 10.

In all but the set of 10 items he made higher error scores than the mean error score for normals; however, in only one set did his error score exceed the mean of a frontal lobe group and that was in the set of 8 where he made 4 errors. The mean error score for left frontal lobe patients on that task was 3.2. All his error scores were below the mean error scores of the right frontal lobe patient group.

Looking across sets, his total number of errors exceeded the total mean error scores of the normal group only, and were less than the total mean error scores incurred by both frontal lobe groups.

The Questionnaire On Organizational Skills--Subject A

Procedure

Transcripts of responses to the Questionnaire on Organizational Skills were examined for general impressions. The tone or feeling conveyed was described, the emphasized topics were discussed, and example quotations were extracted.

Using the transcriptions and themes from the twenty questions which made up the Questionnaire on Organizational Skills, subjects' responses were grouped into six separate organizational skills: general organization, planning, inspection, regulation, verification and correction. The use of the examples and spontaneous utterances was examined as well as the frequency of responses which were yes, no, or situation dependent. By quantifying these responses, subjects' performances across these organizational categories were examined and an attempt was made to see how subjects viewed themselves in terms of strengths and weaknesses, as well as how those views compared to the descriptions of their teachers when those instructors answered the same questions.

Meaning units were also examined for preciseness. Descriptors were: word, comment and elaboration. Each of these descriptors were further categorized as general or precise. Statements were also examined to see if they reflected spontaneous replies or whether they were simply agree/disagreements or parrotings of the examiner's words. In essence, the majority of statements showed subjects' agreement or disagreement with a posed question. Thus, those so labelled were limited to words or comments which served no further purpose and gave the examiner no knowledge beyond if the behaviour was engaged in, not employed, or sometimes utilized.

General Tone

Subject A's responses were not in the form of free-flowing descriptive answers. If the frame of the question would permit him to do so, he would respond with a word. When pressed for elaboration, he tended to supply generalizations. For example, when asked if he made plans for assignments, he said, "Yeh." When, after making some supportive statements, the examiner asked him, "Can you think about the kind of plan you would use for a subject? - Any specific . .?" Subject A replied, "No." When pressed further, reminded of the need for verbalizations and given a subject area to help him to focus his remarks, Subject A responded: "I'd look it over."

Another difficulty in gaining a true picture of Subject A's opinions was that he used researcher stimulus examples, not as a leaping-off point, but as a basis for agreement; he would simply follow the suggestions by saying: "Yeh." He also used stimulus statements as models to parrot. Here the researcher might give him two examples; he would simply repeat one with no further verbalizations to give insight into his actual working approach.

Examiner:	How would you make corrections in Math? Would you do the question over again too, or would you tend to erase and just do part of it?
Subject A:	I'd erase and do part of it.

In pressing for specificity or elaboration, the researcher sometimes elicited a changing picture. In the following excerpts from the transcript, the subject has just identified Social Studies as a subject he often feels "lost in" when working.

Examiner:	Can you describe a bit about what that's like?
Subject A:	You have to memorize all this - words and stuff.

Examiner: Mhm - So the facts just don't come to you when you want them to?

Subject A: Yeh.

Examiner: Or is it that you don't find it interesting to memorize?

Subject A: Don't find it interesting.

Sometimes Subject A would retreat into generalities when pressed to be explicit. In some cases these statements were somewhat helpful in studying his approach to his school work:

Examiner: Do you have a method for looking for errors?

Subject A: Yes.

Examiner: And what is that method?

Subject A: I go over them.

Examiner: And by going over them you mean . . ?

Subject A: Read them over.

Primarily, however, his responses showed an interesting picture of how restrained he was. Whether prompted by the fear of punishment instilled in his previous schooling or other factors, it was clear that Subject A had a great deal of difficulty sharing conclusions about his study habits. He sought the safest ground, incorporating the four techniques of terseness, agreement, parroting and generalizing. At least three of the approaches are seen in the following excerpt:

Examiner: Do you proofread the written assignments you do?

Subject A: Yeh.

Examiner: Do you proofread every time you do a written assignment or just sometimes?

Subject A: Sometimes . .

Examiner: What would be the difference in making you proofread or not?

Subject A: You get to know about the errors when you proofread."

Examiner: O.K., but what would make you proofread in one situation and not in another?

Subject A: Mmm.

Examiner: Would it have anything to do with the amount of time you have? Like, if you had to get the assignment done . . ?

Subject A: Yeh.

Examiner: That's probably true - Would it have anything to do with how interested you are in what you're doing? Like, would you be more likely to read something you're interested in than something you're not?

Subject A: Yeh.

The three "senses" one experienced in speaking to Subject A were:

1. that he wanted to give answers which pleased--not to ingratiate himself but to protect himself;

2. that he had subtle receptive language problems;

3. that he did not have knowledge of how he interacted and learned at school--that it was an analysis he had not made.

In looking at Subject A's performance across the six organizational skills, idiosyncratic response patterns emerged. Overall, he tended to continue his general pattern of terse unelaborated responses. He said simply, "Yes," with no further comment to 8 of 20 questions. His tendency was to choose a more polar stand than to think out situational differences. For example, he gave "yes" or "no" responses 13 out of 20 times, offering qualifying comments in only five situations. These qualifiers did not always clarify his position. For example, when asked if he ever thought about whether he had done what the teacher had asked him to do (Verification Skill Question #5), he replied, "I'd think about it," or, when asked if there was any method he used to go through and correct his errors (a follow-up question to Correction Skill Question #6), he said, "I use a method." For many questions the examiner needed to give a number of follow-up queries in an attempt to understand his answer but again ran the risk of his changing the answers as probes were extended. An example is shown below:

Examiner: Do you make corrections that are noticed by yourself?

Subject A: No.

Examiner: No, O.K. Do you notice errors?

Subject A: Yeh.

Examiner: O.K., so you would correct that yourself if you noticed it? (Examiner aware of the unusual syntax of her first question.)

Subject A: Yeh.

Subject A stood out from the other subjects; that is, he was the only one to reply as he did in seven of the twenty questions. For example, in Question #19 (Planning Skill) all other subjects gave specific examples of how they set priorities when they had to finish a number of assignments or tasks, while Subject A said, "I just start." Because he had chosen to use one of the examiner's alternatives, some follow-up probing was done. It was not until the examiner gave another alternative some four probes later that he gave any specifics. The developing scenario is outlined below:

Examiner: O.K. Do you set priorities? If you've got a number of things to do - like homework, for instance - do you set priorities or how do you choose? Well - first of all I'll just ask you that - Do you set priorities? - And that means are you going to do something before something else or do you just start?

Subject A: I just start.

Examiner: So you don't make any kind of plan for what you are doing?

Subject A: Sometimes.

Examiner: What - how would you make that plan?

Subject A: I'd think it over.

Examiner: And what would you then to do first?

Subject A: (indiscernible)

Examiner: But I mean - what subject would you tend to do first? - What would you tend to choose? - Something you like or don't like?

Subject A: Something I like.

Essentially, the examiner was usually only able to get a specific response when the subject parroted alternatives which she presented. When spontaneous comments or descriptors were given, as mentioned previously, they revealed that his metacognitive skills were minimal, that he was fearful of responding, or that he had some language difficulties.

Another instance of Subject A standing quite apart from his peers was in response to Correction Skill Question #18. When asked if he handed in what he would call a polished product, he said simply, "Yes." All other subjects gave situation-dependent responses and elaborations to that particular question.

There was quite another and perhaps more interesting pattern emerging from Subject A's answers. In all six organizational categories he saw himself as engaging in the organized behaviour more than not (see Table 106). Ten out of twenty-one responses reflect a firm statement of use of the skill about which he had been questioned. Only three indications (Questions #19, 8 and 4) of a behaviour not being used were given. The seven remaining responses indicated that sometimes the behaviour was followed and sometimes not. On one of these latter responses (Question #6), Subject A was quite equivocal. However, he saw himself engaging more often than not in the behaviours which were included in the questionnaire. In general, this opinion was not in keeping with his teachers' opinions. Subject A received the lowest organizational ratings by both academic and nonacademic teachers when compared with other subjects in the present study. Looking more closely at patterns, one sees that both teachers rated him most highly in General Organization, the area where he most consistently gave strong affirmative responses himself. His lowest ratings were assigned in

Verification in his work in the Learning Assistance Program and Planning in English. Subject B had given a strong "no" in response to one of the questions in each of the categories of Inspection and Regulation (see Table 106). Quantifying responses by assigning a yes: 3 points, a sometimes: 2 points, and a no: 1 point, yielded a pattern seen in Table 89. A further step of establishing ratio scores allowed the researcher to establish a single score for each skill which could be compared to other figures (see Table 90). In this step it is seen that Subject A rated himself lower on Regulation than any other skill. Planning was second lowest rating but only marginally below other scores.

In examining each meaning unit for preciseness, it was found that Subject A made 44 verbalizations which were single words, 38 one-thought comments, and 1 elaboration. Only 14 precise utterances were found, 2 of which were words and 12 which were comments. Seventeen of his contributions were completely or in part repetitions of the examiner's words. These parrotings formed almost half of the comments he made. Combining this information with the fact that 32 of his words were composed of "Yeh" responses, answering without any expansion the examiner's question, or confirming her statement, one sees that Subject A contributed very little of himself to the discussion.

The Interview Regarding Study Habits--Subject A

Themes from Questions 3, 4, 6 and 7 and 9 from the Interview found in Appendix J were examined and labelled as to whether they reflected the subjects' knowledge of their study and work habits or

Table 106

A Summary of Subject A's Responses to the Questionnaire

Skill		Response
General Organization Skills	#1	Yes
	#7	Yes
	#13	Yes
Planning Skills	#2	Only sometimes (no specifics)
	#9	Yes (no example)
	#14	Not always - situation specific response
	#19	Just starts - no priorizing
Inspection Skills	#3	Yes - general comment
	#8	No - specific comment
	#15	Yes - comment
Regulation Skills	#4	No - general comment
	#10	Sometimes (no example)
	#16	Yes - specific comments
	#20	Sometimes - specific comment
Verification Skills	#5	Yes - general comment
	#11	Yes - specific comment
	#17	Sometimes
Correction Skills	#6	No, then Yes (no examples)
	#12	Sometimes (no example)
	#18	Yes (no example)

demonstrated their awareness of their ability to regulate those habits. Criteria for assignment of "knowledge of" or "regulatory" labels were adapted from Brown and Palincsar's 1982 discussion of metacognition and may be found in Table 95. In example, a verbalization identifying a research technique such as "looking it up in books" is a knowledge statement regarding study habits, while a subject saying the he "started [researching] early because I found I needed all the time I could get" shows a regulatory component.

Notation was also made when the subjects did not seem to know how they could intervene to change an ineffective habit. "Knowledge of" labels were further defined as general or specific. As well, total theme and spontaneous theme patterns were established by ranking the number of statements falling into the two "knowledge of" and the "regulatory" categories.

The stipulated sections of Subject A's transcript were divided into thirty-nine themes, two of which represented absence of skills being investigated: one, a lack of knowledge, and another, an inability to regulate his actions. At first he said that he did not know why he had not done well in school. He was also unable to verbalize what he would do in the library if the librarian was not present, other than seek a teacher's help. Fifteen of the remaining thirty-seven units, a considerably high proportion, were composed of statements which either reflected a straightforward agreement or disagreement with the examiner's probes or which simply parroted the examiner's words. Only twenty-two spontaneous themes could be found. Just over half of his specific "knowledge of" statements, just under half of his "regulatory" statements, and approximately one third of his general "knowledge of" statements were directly infuenced by the examiner's words.

In analyzing the themes and underlying transcripts of Subject A's responses to the Interview Regarding Study Habits, a pattern emerged. Subject A made twenty-nine "knowledge of" statements compared to only eight "regulatory" statements. He made many more general than specific knowledge statements, twenty and nine respectively. Looking at his spontaneous statements, the balance swings even more greatly toward general "knowledge of" statements. Respectively, the number of spontaneous statements were 14, 3 and 5 for general and specific "knowledge of" statements and "regulatory" statements.

In summary, Subject A's verbalizations were greatly influenced by the examiner's probes. His utterances were predominantly "knowledge of" statements and the majority of those were general in nature. There was little indication of regulation or specific knowledge of study habits. His total theme and spontaneous theme patterns differed.

The examiner did not sense that she was gaining a true picture of Subject A's approach to studying. In addition to the fact that he seemed to want to say what he should say rather than to describe what he did, his generalities made it almost impossible to grasp a picture of his study habits. An example of the obscurity of his verbalizations follows:

Examiner:	What do you do when you're left pretty well on your own to do an assignment like say writing an essay?
Subject A:	I studied for it.

On at least four occasions in the Interview, Subject A projected helplessness. For example, after giving a vague explanation of how he would get information for a report he was writing, he could not seem to describe the specifics of finding a book in the library. When pressed, he said he would ask the librarian. When pressed further and told that the librarian had stepped out of the library, he said he would ask his teacher. He used the same explanation later when he was asked how he would find a specific chapter in a book. In the last instance, this seeming lack of knowledge was even more difficult to accept as he had shown at least an inefficient approach to using a textbook in the Text Search Task which he had completed six months earlier.

Subject A could not effectively explain his approach to school-related tasks. He did not seem to know what he did and had less idea of how to regulate his learning behaviours. His ability to reflect regarding the success of others was also limited. The only explanation Subject A would venture as to why some students do well in school was that they are interested in the subject in which they do well.

CASE STUDY BASED ON DATE COLLECTED FROM SUBJECT B

The Academic Processing Skills Assessment--Subject B

Subject B was sixteen years five months old during the initial data gathering and seventeen years of age during his final involvement with the present study. When he joined the study, he was in Grade 11, carrying seven subjects. Three of the subjects were nonacademic and related to his field of interest, which was carpentry. Just prior to the data gathering, he had obtained grades of 75 percent in each of his building courses. In contrast, he had passed only one academic subject, that being Biology, with a mark of 50 percent. His overall average was 56.3 percent.

Stanford Achievement scores in reading obtained the previous year indicated good decoding skills but a comprehension score at the 12th percentile. This pattern was later confirmed in further individualized testing done for purposes of the present study.

Subject B's WISC-R scores showed a fifteen-point split between Verbal and Performance IQs, Performance being the higher. His scaled scores ranged from 7 in Vocabulary to 17 in Coding. The psychologist testing him approximately one year before the present study had noted that he exhibited an unwillingness to try. The Verbal and Performance IQ scores obtained were five points lower respectively than those obtained eight years earlier.

The results of Subject B's then most recent intellectual assessment (WISC-R) yielded a Full Scale IQ score at the 68th percentile, which fell into the Average classification. His higher Performance skills had been consistent over the years and his strongest observed talents were primarily in less verbal tasks.

Subject B showed a marked change in attitude from the first data gathering for the present study to the second period of collecting information seven months later. He was no longer doing well in his favourite area, that of carpentry. A young man who loved to build cabinets, he found the only building course available to him was in drywalling. Just turned 17, he had become truant and discouraged.

Subject B was a young man who had quite clearly in mind what trade he wished to follow in his life. He knew which subjects and which teachers gave him what he wanted and which did not. He seemed to have a fairly good idea of his own abilities and was cognizant of how he learned best. However, there was a rigidity with which he approached decisions which jeopardized his long-range plans and interests. This tendency was seen in his resistance against learning an aspect of his trade which was not his favourite dimension of work. It had also been seen in his decision to drop out of Math after Junior High. He felt that he needed individual attention to grasp concepts which he could not master in a lecture setting. His Math teacher had elected to use lecture only with no individualized instruction, and thus he discontinued his study in the area despite his ability. At the time of the present study, his score (untimed) on the WRAT Arithmetic subtest was at the 81st percentile, demonstrating good retention of skills. He also obtained a scaled score of 11 on the Arithmetic subtest of the WISC-R.

His percentile scores in the Reading skills measured were highest in word attack, where he obtained a score at the 74th percentile. However, he did not overtly employ those skills when reading individual words. In the latter situation he tended to read words as instantaneous wholes, checking his utterances against his vocabulary for verification. His ability to read words in isolation was grade appropriate, reaching the 45th percentile. Many of his errors consisted of wrongly accenting syllables or substituting a variant vowel sound. His greatest difficulty arose when the Word Passage test of the Woodcock was administered. In doing this cloze comprehension task, he reached only the 28th percentile.

Results of the Malcomesius indicated the possibility of visual memory problems when he was asked to revisualize a word from an auditory input. Spelling errors tended to be phonetic (bottem for bottom). There was some indication of residual reversal problems in a copying task where he wrote was for saw.

Scores on formal language tests were primarily at or above the expected criterion for his age. His above criterion scores included Grammatic Competency on the Fullerton as well as Processing Relationships and Ambiguities and Producing Formulated Sentences on the CELF. He did score one standard deviation below the mean on the Idiom subtest of the Fullerton. In explaining the idioms, he interpreted "to throw a monkey wrench into it" as to "try harder" and "under the weather" as "the weather should be different than it is." His age score on the Verbal Absurdities subtest of the Detroit was some two years below his chronological age.

Despite the largely acceptable results of the formal language measures, Subject B's verbalizations did not flow in the normal pattern. His narrative was riddled with false starts. Two examples extracted from his Interview transcript illustrate this tendency to repeatedly dart into and away from his point and show what was typical of all his verbalizations.

> Example 1: K. - ah - you might - O.K. I've ne - the index is in the front - I think there's a glossary.
>
> Example 2: I knew - I knew - I knew - I knew it was there - but I must have been taught it cause if I - I never picked up a book before - and - maybe I just picked up a book and looked through the - just opened

up the book and (etc.).

The examiner was less aware of Subject B's unusual speech during the conversation than she was when transcribing his words. There was little natural flow to his language production. Subject B used his hands when speaking and tended to make movements with them while word searching, almost as though he was trying to make the word come more easily by his gestures.

Subject B's memory for related syllables or meaningful sentences appeared to be better than his ability to remember unrelated words as measured by the Detroit. The age scores were 9 years 9 months and 8 years 10 months respectively, both being considerably below his chronological age. His memory for numbers seemed adequate. He obtained a scaled score of 10 on the Digit Span subtest of the WISC-R.

Subject B was seen differently by one of his academic teachers and a nonacademic instructor, as reflected on the twenty-point questionnaire. His English teacher rated him at 36, commenting that while he was courteous and well-behaved in class he came to school without his homework done and appeared not to have prepared for exams. His woodworking teacher, on the other hand, rated him a 69 and saw him as doing well in the class.

The Rods Task--Subject B

Sequentially, the subtask sequence of the Rods Task moved from Free Performance 1, or Trial 1; to Pairs Choice; to Free Performance 2, or Trial 2; to Final Choice; and then to Independent Test. Following the task, metacognitive questions were asked. Before the experiment began, and after it was concluded, subjects were asked to name things which they thought mattered for bending.

Free Performance One

Subject B was unable to use the control-of-variables strategy in his first Free Performance Trial. He made eleven tests and mentioned all six variables while testing. He made unconfounded tests of two variables: material and position of weights. He conducted what might have been termed an unconfounded test of base, but did not mention base while conducting the test. However, he seemed more to stumble on these tests rather than to be consciously aware of limiting variables. Indeed, Subject B approached the first Free Performance Trial with some interesting idiosyncracies. For one thing, he compared bending across trials rather than restricting his comparison to the rods before him. This made some of his verbalizations seem unrelated to the rods before him. For example, while working with 40-2-P (a plexiglass rod) and 40-2-S (a metal rod) he said, "This plexiglass is more flexible than the wood in the longer lengths." In making this statement, Subject B was obviously referring to 40-2-W in W (a wooden rod) which he had compared to 40-2-S in his previous test.

Subject B seemed to be making across trial comparison to find the most flexible or strongest materials rather than finding out what variables mattered for bending. For example, he made statements like "This is probably closest to the metal (referring to a wooden rod outside of the pair he was testing), other than this one of the length - or this one because of the length again and diameter."

Subject B also engaged in attempted scientific explanations. For example he said:

> The wood is more flexible than the metal - the pores wider in - rather - in - the metal - it's more of a solid than this is more of a material rather than a solid, it's got pores in it and everything and you can do different things with it - if you put it in water long enough you can shape it and everything while the metal you have to heat it up quite a bit.

On another occasion he referred to "less visosity" by which he agreed he meant viscosity.

Pairs Choice

Subject B was 80 percent accurate in the pairs choice, judging the better or unconfounded from the two tests presented to him in four out of five attempts. His reasoning was rarely clearly expressed, reflecting his less than fluid expressive language style. Only two of his five explanations referred to control-of-variables reasoning; the others stressed comparative flexibility or, in the case of the final explanation, became almost too convoluted to follow, i.e.:

> O.K. I'd say this pair right automatically because metal wouldn't bend as - wouldn't - it would bend but it wouldn't bend 'cause of the kind of material it is. If it was in wood it might bend more because wood is more of a material you can sink your fingernails into rather than plexiglass even though it's flexible and thin - well, long and thin - long and thin - if this was - the bases were thicker - thinner and longer - even if this was - what - two feet? You could probably bend it.

Free Performance Two

Subject B began his second Free Performance task by zeroing in on a metal rod with a shinier surface than the others he had worked with and by declaring that he would compare it to all the materials. Thus, even after the very explicit wording of the Free Choice segment, he held firm to his earlier approach to the task. At one point he said, ". . . should see which one is more flexible to the - most flexible to the least flexible."

Subject B referred to five of the six variables on the second Free Performance Trial. He made only one unconfounded test and that was of material, decreasing the number of unconfounded tests by two. He obviously did not achieve the use of the control-of-variables strategy. However, his explanations were on the whole more to the point when compared with his responses to the first Free Performance Trial.

Final Choice

In the final choice phase, Subject B made one error. He was required to answer "yes" or "no" to six questions which asked him to judge whether the examiner-displayed set of rods was a good test of a specified variable.

Metacognition

Prior to the first Free Performance Trial, Subject B could name four possible variables which made a difference for bending. Following the Independent Test, he named five variables. In this final naming, he named three variables he had named initially; he left out one valid variable, i.e., where the weights were placed; and added the red herring variable, the base.

When asked if he had changed his mind about what mattered for bending and if he had learned anything by doing the experiment, he kept his comments restricted to a comparison of which materials bent the most. He stated that he had initially felt that wood would bend more than plexiglass but found the reverse to be true.

The Text Search Task--Subject B

The Text Search Task was divided into three parts. The first part consisted of an introduction of the materials, a demonstration of the principal features of the text (without describing their use) and an open-ended instruction to find the answer to a specific question. The second part was an elicitation phase which consisted of a three-part demonstration of the text search strategies of varying efficiencies from which subjects were to select the best approach. The third part of the session was another open-ended question which permitted subjects to demonstrate any changes in strategy use.

Trial One

Subject B utilized a type 2 strategy and successfully found the answer to the first question posed to him. He found the correct entry in the table of contents, then turned to the chapter, where he turned the pages systematically page by page looking at the pictures to assist him in locating the section. At that point he began to read the text and examine the diagrams to obtain an answer to the question.

Demonstrations

Subject B did not choose the most efficient of the demonstrations during his first attempt to do so but selected the best example in the second demonstration. In the first instance, he confused the function of the index-glossary of the Heath Series with the more traditional glossary even though the difference had been explained earlier and the term "index" had been used in the demonstration. His explanation was clear and logical and was based on his understanding of the terminology.

Demo 1

Examiner:	O.K. Which of those three methods do you think is best?
Subject A:	The second one.
Examiner:	The second one?
Subject B:	Yeh - 'cause you're just - O.K., you're looking for the parts of the body of the insect - right? O.K., so - you just have to look in the - what do you call it? - the table of contents.
Examiner:	Mhm.
Subject B:	Just find it under insects and as soon as you find insects you can just go to the chapter where it is on and look through the whole chapter. There's no sense in looking through the glossary unless you want to find definitions of words that you don't understand too well . .

Following his explanation, Subject B was once again made aware of the dual nature of the index/glossary by use of the terms rather than explanations.

Examiner: O.K., in this book it's a glossary and an index.

Subject B: Mm. O.K.

Examiner: And I'm using it as an index, not a glossary - O.K.?

Subject B chose the most efficient strategy during the second demonstration and gave a related explanation. He had great difficulty verbalizing and made circular motions with his right hand as he spoke as though he was attempting to draw out the words.

Demo 2

Examiner: O.K., so which of those three methods do you think was the most efficient for finding out what the text said about plants using carbon dioxide?

Subject B: O.K. The last one was the best because it showed the different - O.K. - it showed how places can be different found - O.K. It was better because you can find places in the book - different places where the - where the carbon dioxide could be la - would - could be located.

Trial Two

Subject B used a type 3 strategy in finding the answer to the second question posed to him in a free performance setting, However, he employed that strategy only when the type 2 he initiated did not prove to bring him the answer successfully. He made this decision independently without any intervention questioning on the part of the examiner. He was therefore classified as one in whom the strategy had been elicited but his manner in using the strategy necessitates a qualification of the classification.

Examiner: Now, I'll give you one more - What does that book tell you - and how could you use that book to find out what it has to say about how the muscles are used in breathing? How the muscles are used in breathing - and would you talk to me about what you are doing as well as show me how you would use the book to find out how muscles are used in breathing?

Subject B: O.K. I would turn to the table of contents - look up for - just look up something for muscles and everything - Found it in chapter three, page 79 - find page 79 - find bones and muscles - flip through - find muscle tissue [points directly to picture] and all that - K - I have to find out? [forgets question]

Examiner: How muscles are used in breathing.

Subject B: How muscles are used in breathing?

Examiner: Mhm.

Subject B: So, I'd look - I'll find out - I'd see if (mumble) involved in muscle - ah - area of the book - K. still flipping through - can't find anything so I'll go to the back of the book - use the glossary or index - look up muscles - or breathing - K. find breathing - look up for - oxygen - carbondioxide - ah - K. find out first page - last page - 107 - 79 to 107 - if there's any pages in between there might have to deal with the muscles - so page 95 - for breathing - then I'd look up muscles -

Examiner: O.K.

Subject B: - and breathing - on page 94, 95 - the same page - find the page and then discuss it from there.

Throughout his explanations Subject B made circular motions with his hands whenever he was searching to improve his explanations. Once again, he seemed to be pulling out the words with his hands.

Metacognition

When asked to choose between the two methods which he had used, Subject B chose the type 3 strategy which he used in Trial Two. When asked why he chose that strategy, he said, "because it shows me a pinpoint place where the information is located - instead of just flippin' through - back and forth." Although he clearly verbalized that use of the index was advantageous (see Table 35 for response to Question 4), he went on to explain that the procedure he had used in Trial Two would be his choice. That is, he would use Strategy 2 before employing Strategy 3.

> Examiner: So is the main advantage [to Strategy 3] to save you the flipping through process?
>
> Subject B: Well, I'd flip through anyway.
>
> Examiner: Mhm.
>
> Subject B: First of all, just to see what's goin' on in the book - see if they're telling me everything that's O.K. and everything - and everything like that - and that - flip through the back and if I couldn't find it, then I'd go to the back.
>
> Examiner: Are there any advantages to going to the back besides if you can't find it?
>
> Subject B: Well, the words K - say, if you were lookin' up muscles - has different definitions plus different areas that deal with muscles.

These verbalizations show that Subject B saw the efficiency of the type 3 strategy but would not let go of his own reasoning that as long as the type 2 strategy worked it was acceptable. He made it clear that he felt that type 3 strategy should be employed only as a last resort.

In summary, Subject B, who employed an elicited strategy in Trial Two, seemed to have knowledge of what he had learned. He also appeared to have decided quite consciously that he would not regulate his actions according to his new-found knowledge unless type 2 approach failed.

The Errand Planning Task--Subject B

In the Errand Planning Task, the subject was essentially required to organize a list of errands. He was to decide which errands he would do, the times at which he would do them, and how he would get around from errand to errand. Sequentially, the subtest sequence was a Free Performance step in which he was given two opportunities, Trial 1 and Trial 2, to plan and verbalize his strategy; a series of three pairs of scenarios which he had to judge as to their relative efficiency; and another Free Performance Trial, or Trial 3. Following the task, metacognitive questions were asked. Trials were compared by examining student references to movement, time, and errands, and for that reason the discussions will be in terms of those three elements rather than a sequential description of performance of the task elements.

Movement

Subject B made the most references to movement in the initial trial of the three trials of the Errand Planning Task. However, although there was a drop in the percentage of specific references from Trial 1 (76%) to Trial 2 (70%), there was a considerable increase in proportion of specific references in Trial 3 (85%). He used walking most frequently, with taking the bus and riding his bike used equally on an intratrial basis. While the number of usages varied from trial to trial, the proportions of usage referring to type of movement remained about the same over the three trials. It is unlikely that eliciting contributed to the increase in percentage of specific references since the actual number of specific references declined from 19 to 7 from Trial 1 to Trial 2 and then, after elicitation, increased to 11 on Trial 3.

The average number of references for movement made by subjects of the present study were 16.71, 15 and 12.57 respectively for the three trials. Subject B made 25, 7 and 11 references in relation to his movements while outlining his plans for accomplishing the errands.

Demonstrations

Subject B chose the preferred scenario on all the demonstrations, isolating the unreasonably long wait at the dentist's office on the first demonstration, and recognizing on the third demonstration that, when he was going to the party later, it would not be an efficient use of his time to make a special trip earlier. In the case of the second demonstration, he self-corrected his original incorrect choice. In his self-correction, however, he noticed only that he forgot to meet his friend for lunch in making the less preferred choice. He had, he said, thought he would save some money by eating at his grandmother's. The inefficient aspects of temporal and distance elements which he included in his exclusion of the unpreferred strategy in the first demonstration were not mentioned in his explanation of his choice in the second demonstration.

Time

Subject B made six references to time on his initial attempt to plan a day's errands, no mention of time on his second trial, and eleven temporal references on the third trial which followed the demonstrations. The range of his references expanded from two hours in the first trial to eight and one-half hours in the third trial. It would appear that the demonstration elicited an improvement in the number and range of time references for Subject B.

Errands

Subject B omitted only one errand on each trial in completing the Errand Planning Task. In each case he did not mention retiring. In the third trial he reported doing only eleven errands rather than the twelve he had outlined in Trials 1 and 2. He had, however, inferred that he dropped off his books when he said that he had gone to the library.

Metacognition

Subject B said that he had learned from doing the Errand Planning Task that "that's what I should do - just plan out everything - before I . . ." He then lapsed into an explanation of his mother's approach to planning rather than relating his explanation to the task he had just completed. When asked to evaluate his own planning, he showed a good understanding of two of the elements the task involved: time and number of completed errands.

Examiner: What do you think of your planning that you did today?

Subject B: Well, just that it was on schedule.

Examiner: Mhm.

Subject B: It - done everything that I was supposed to do.

Examiner: Mhm.

Subject B: (Mumble) and - K. - you said that I didn't have to do all of the things - but I just - I wanted to get them all - all over with.

General Comments

Subject B referred to the written copy while the scenario was read for the first time. He did not, however, give himself time to become familiar with the map itself before he began to verbalize his plan. He referred to the written version again after he had worked for some time on the first trial after saying, "Is there anything else I have to do?" and made another referral a few minutes later when still working on the first trial after he said, "Did I miss anything?" He referred to the paper a third time when he concluded the first trial. He made no reference to the written sheet on the second or third trials.

Subject B tended to cluster his errands when planning. He used gesture a great deal following the routes he was explaining with his hands. He touched the map frequently both when moving from place to place and in pointing out a place. This actual touching increased progressively as he worked. His movements, like his speech, however, were not precise. Other movements of a nonindicatory nature were also observed. For example, he made walking motions with his fingers at one point to illustrate walking and made circulatory motions with his hands as he spoke. Interestingly, he pointed to things on the left side of the map with his left hand, but rather than reach across the midline, he switched to the use of his right hand for objects on the right side of the map.

In his verbalizations on the first trial, he was constantly backtracking and beginning again. He became better able to talk his way through the plan as he worked.

The Self-Ordered Task--Subject B

The Self-Ordered Task consisted of organizing and carrying out a series of pointing responses. Each subject was required to touch pictures in a sequence according to a plan which he initiated and monitored. There was a high nonverbal visual memory component in the task.

Subject B worked slowly and methodically on the Self-Ordered Task. He took longer than the other six subjects to complete each set, having the longest average times of any subject in the present study. There was an increase of 110.67 seconds between the times taken on set 6 and set 12. Each set took considerably longer than the previous one to complete in keeping with the increasing difficulty of the task. For example, he took more than twice as long to do set 8 as he had set 6, just under a third more time to do set 10 as set 8, and about a quarter more of the length of doing set 10 to do set 12. He was markedly below all error means for normals as well as left and right frontal lobe patient groups. In short, he did the task carefully and meticulously, making only 2 errors in all.

The Questionnaire On Organizational Skills--Subject B

Procedure

Transcripts of responses to the Questionnaire on Organizational Skills were examined for general impressions. The tone or feeling conveyed was described, the emphasized topics were discussed and example quotations were extracted.

Using the transcriptions and themes from the twenty questions which made up the Questionnaire on Organizational Skills, subjects' responses were grouped into six separate organizational skills: general organization, planning, inspection, regulation, verification and correction. The use of the examples and spontaneous utterances was examined as well as the frequency of responses which were yes, no, or situation dependent. By quantifying these responses, subjects' performances across these organizational categories were examined and an attempt was made to see how subjects viewed themselves in terms of strengths and weaknesses, as well as how those views compared to the descriptions of their teachers when those instructors answered the same questions.

Meaning units were also examined for preciseness. Descriptors were: word, comment and elaboration. Each of these descriptors were further categorized as general or precise. Statements were also examined to see if they reflected spontaneous replies or whether they were simply agree/disagreements or parrotings of the examiner's words.

In essence the majority of statements showed subjects' agreement or disagreement with a posed question. Thus, those so labelled were limited to words or comments which served no further purpose and gave the examiner no knowledge beyond if the behaviour was engaged in, not employed, or sometimes utilized.

General Tone

Subject B's responses were given in the same detailed, often convoluted style that he had used throughout the interactions associated with the present study. His tendency to go off on tangents was still present and precise information was often hard to obtain.

Examiner:	Do you think that you notice errors? Again it may be different in different settings.
Subject B:	I notice - like I notice when someone's doing - doing the actual error when they're doing something.
Examiner:	How about yourself?
Subject B:	Oh, I . .
Examiner:	Do you see your errors?
Subject B:	I think — I think about - about it twice - Like, I would start - Let's say I would be chiseling and - I would think about it first of all -(unintelligible) ah, which way's going - which way's going to be faster, that's what I was thinkin'.
Examiner:	O.K.
Subject B:	Mmm.
Examiner:	. . and if an error?
Subject B:	Mm - I'm sort of getting off.

Examiner: That's O.K., and do you notice an error - Do you think you notice your errors as you are doing things?

Subject B: Mm - I think so.

Following this exchange, the examiner extended four more probes to try to determine how Subject B examined his work for errors. He gave no precise information but added that he would "read over" an essay and would "just look at" something he was building.

Subject B made it clear that class requirements did not always interest him. However, he did not seem to be rebellious against work itself but was more in opposition to the nature of the work.

Examiner: Do you usually begin a task right away when you're asked to do something in school?

Subject B: Um - if there's - if there's nothing else to do - there's no reason why I shouldn't start right away.

Examiner: What else might there be to do?

Subject B: Ah - another - somethin'.

Examiner: Another subject?

Subject B: Something that's in my mind - that I wanted to do - I'd go to English and he'd give us an assignment and then I'd just do the assignment really quick - just to hand it in so I could do something else - then I could or I - just forget about even what's goin' on in class and draw up a (unintelligible) or somethin'.

As seen in the above example, Subject B did not seem to feel the need to agree with the examiner when she extended probes to help clarify his meaning. He wanted to make his alienation from the system clear. He spoke with an air of lament about the differences in Junior and Senior High. He stated that he would approach classmates rather than teachers if he needed assistance.

Examiner: But you'd go to the kids first?

Subject B: Mhm - cause - oh - they're - they're at my thinking level.

Examiner: Do you find their explanations easier to follow?

Subject B: Yeah - teachers there to teach you - students are there 'cause they have to - K. He's - teachers there to show you how to do things right? But I wouldn't go to a teacher - I'd go to the student - 'cause they have - they can communicate better - the teachers try to stress upon - the student would just say: "just look, look at this - this is all you have to do . . ."

Examiner: Do you occasionally find a teacher that does that too?

Subject B: Umm - in junior high there was lots of teachers - now - in high school - teachers aren't - aren't as helpful.

Self-Perception of Organizational Skills

In looking at Subject B's performance across six organizational skill areas, response patterns emerged. Overall, he continued with his pattern of elaborated responses. Eighteen of his twenty responses were accompanied by example (see Table 88). Ten of those examples spontaneously followed the examiner's first question. Subject B saw himself engaging in organized behaviours more often than not. Ten of his responses were strongly affirmative with another five indicating situation dependent or usual usage of the described technique. He only denied utilizing four of the strategies outlined by the examiner: being on time, integrating earlier aspects of his work; feeling directed; and making corrections as he went along. However, even in this latter situation he agreed that it might depend on what he was doing.

By quantifying his responses as described in Steps Twelve through Fourteen of the procedure for analyzing the Questionnaire On Organizational Skills found on Chapter V of the present study, it was possible to ascertain Subject B's relative ratings of himself [illegible] the six organizational skills being examined. Through this step, it was seen that Subject B rated himself lower on General Organization skills than on any other skill area. He rated himself most highly on Verification skills.

Comparisons of Self-Perceptions with Teacher Perceptions

Subject B's quantified scores and relative rankings were then compared to how he had been rated by his Woodworking teacher and his English teacher (see Table 91). It was discovered that his rankings corresponded in part to those of his Woodworking teacher. Both he and the teacher in this less academic setting saw him weakest in General Organization. However, the same teacher reported him as being equally weak in Verification and Correction. Subject B had, as mentioned, rated himself highest in Verification. His Woodworking teacher rated him most highly in Inspection, the skill in which Subject B had rated himself second highest but not much higher than his other skills.

There was no similarity between the way Subject B and his academic teacher rated Subject B's organizational skills. His English teacher saw him as best in General Organization, in which he had rated himself the lowest, and least proficient in Correction, in which he rated himself quite highly.

In addition to the positive pattern seen in his grouped responses from the Questionnaire, Subject B described himself as organized when asked outright if he was organized or disorganized. Subject B's generally high opinion of his organizational skills was upheld again by his Woodworking teacher. Subject B and Subject C shared the highest overall rating given by nonacademic teachers on the Questionnaire On Organizational Skills used in the present study. Subject B's English teacher, on the other hand, saw him as disorganized and commented: "_________ is courteous and well behaved in class, but comes without homework done or appears not to have studied for exams."

Preciseness of Verbalizations

In examining each meaning unit for preciseness, it was found that Subject B's verbalizations were primarily in the category of "comment" and that he made general comments more often than precise ones (see Table 93). Indeed, he made more General Comments and General Elaborations than any other subject in the present study. Seventy-one percent of Subject B's statements were his own. That is, they were not composed of simply agreements/disagreements or parrotings of the examiner's words.

The Interview Regarding Study Habits--Subject B

Themes from Questions 3, 4, 6 and 7 and 9 from the Interview found in Appendix J were examined and labelled as to whether they reflected the subjects' knowledge of their study and work habits or demonstrated their awareness of their ability to regulate those habits. Criteria for assignment of "knowledge of" or "regulatory" labels were adapted from Brown and Palinscar's 1982 discussion of metacognition and may be found in Table 95. In example, a verbalization identifying a research technique such as "looking it up in books" is a knowledge statement regarding study habits, while a subject saying the he "started [researching] early because I found I needed all the time I could get" shows a regulatory component.

Notation was also made when the subjects did not seem to know how they could intervene to change an ineffective habit. "Knowledge of" labels were further defined as general or specific. As well, total theme and spontaneous theme patterns were established by ranking the number of statements falling into the two "knowledge of" and the "regulatory" categories.

The stipulated sections of Subject B's transcript were divided into thirty themes. None of his statements reflected an inability to regulate actions or a lack of knowledge. Only three of his statements were labelled as being more the examiner's ideas than his own while the majority of his verbalizations were elaborated spontaneous responses to the core questions.

In analyzing the themes and underlying transcripts of Subject B's responses in the Interview Regarding Study Habits, a pattern emerged. (See Table 103). While "knowledge of" statements made up the largest subgroup of the total statements, a substantial proportion were "regulatory" in nature. Only approximately one fifth more "knowledge of" descriptors were attached than were "regulatory" labels. However, since all "regulatory" statements were spontaneous and three "knowledge of" descriptors were examiner influenced, the proportion of "regulatory" to "knowledge of" statements is even more favourable when only spontaneous remarks are considered, dropping to a difference of only a tenth.

Total numbers of "knowledge of" statements were equally divided between specific and general descriptors. When comparing only spontaneous verbalizations, the general statements exceeded the specific by only one.

In summary, Subject B's verbalizations were balanced, having good proportions of "regulatory" descriptors as well as specific and general "knowledge of" statements. His total and spontaneous theme patterns were quite similar.

The examiner felt that Subject B was sincerely describing how he approached his work although he did become diverted and from time to time moved out tangentially from the theme of the discussion, making it necessary to refocus. For instance, when asked to discuss his performance on school subjects, he digressed to talking about his guitar and how he approached teaching himself to play. On one occasion his digression became extremely unrealistic. The examiner had asked Subject B to describe what he would do if left on his own to write an essay. He replied:

> Subject B: K. I would probably just jot down a few things first of all - probably make - I'd probably want to go on - if I'm going to write about something I really want to get into it - I'd want to write a novel - if you're going to start writing you might as well write - do it on your own.

A few moments later Subject B completely lost his focus and had to ask that the question be repeated.

In contrast to this vague and unrealistic response, many of Subject B's verbalizations reflected detailed descriptions of his approach to tasks. Although his expressive language was frequently convoluted, it was possible to discern the techniques he was describing.

Subject B was frank and seemed to have a good knowledge of his own less than favourable characteristics:

> Examiner: Do you think there are any other reasons why you had difficulty in school?
>
> Subject B: Mm - Well, it's probably because I wanted to do what I wanted to do - I didn't want anybody telling me what to do.
>
> Examiner: Strong willed?
>
> Subject B: Yeah - and I'm still like that.

Subject B seemed to place the responsibility for his school difficulty on family problems and his own personality. He did not seem to be aware of how his learning disability impeded his progress nor did he blame the school, despite the fact that at the time of the interview he was truant because of lack of interest.

Following the formal interview, at the conclusion of formal data collection, the examiner discussed the co-responsibility for learning which Subject B shared with the school and his teachers. In that conversation, what he had earlier described as an avoidance of reading now took on the quality of fear.

> Examiner: You know I just want to say something before we go on to some other things and that is - when you talked about the reason you had difficulty in school you never mentioned your reading. Why? You sort of blamed yourself, you didn't mention your reading. Why? Do you think your reading [difficulty] is your fault? Do you think if you really tried a lot harder you would read better?
>
> Subject B: I don't - You can - you can give me a whole book - with a whole room of books and I'll be locked in there and I'll be locked in the room for a week or a month or whatever - It'd be almost like a nightmare . .
>
> Examiner: Really?
>
> Subject B: I - I - I hate it.

In reflecting on the success of other students, Subject B gave one of his indirect responses, diverting into a comparison of academics and athletics. After a long explanation of how he had completed Grades 1 to 6 then Grade 9 and hopefully Grade 12, he outlined what he saw as the purpose of school.

> Subject B: Now it would probably be better for getting a job 'cause they know you're capable of keeping with it - That's what I think it is . .
>
> Examiner: Mhm.
>
> Subject B: School is just to show you can - you can do something - you can, ah, finish what you've started.

CASE STUDY BASED ON DATA COLLECTED FROM SUBJECT C

The Academic and Skills Assessment--Subject C

Subject C was seventeen years 0 months old during the initial data gathering and seventeen years seven months of age during his final involvement with the present research project. When he joined the study, he was in Grade 11 and carrying nine subjects, seven of which were academic. His overall average derived just prior to the initial data gathering was 46.1 percent. He had obtained his highest grade in Graphic Communications, scoring at 66 percent. He was taking two Math classes with respective grades of 61 and 51 percent. His grades in the two Accounting courses he was taking were also discrepant, 60 and 32 percent respectively. Besides his one Accounting class, he was also failing Psychology.

Subject C, as many of the subjects had, presented a paradox. In meeting with Subject C, the examiner was immediately struck with his maturity and was particularly impressed with his communication skills. His speech flowed easily and he enunciated each word clearly; the prosody was very pleasant. His interactive questioning was relaxed and he expressed himself with ease. The preciseness of this articulation came in part from formal singing lessons.

Formal language assessment showed some areas of strength, yet also revealed some weaker skills. Subject C's age score was two years below his chronological age in his interpretation of Verbal Absurdities on the Detroit, but his ability to process Relationships and Ambiguities as measured by the CELF was above criterion. His

Grammatic Competency was a standard deviation above the mean as measured by the Fullerton, but his ability to produce Formulated Sentences was below the criterion outlined on the CELF. Compared to the norming group, he showed a weakness on the Vocabulary subtest of the WAIS-R. While not reaching the frustration level, Subject C's score on the Divergent Production subtest of the Fullerton was in excess of one standard deviation below the mean. Here he was asked to name as many items as possible which could fall into a specified category within a twenty-second time frame.

Subject C was completely at ease in his communication with the examiner. His excellent social skills, as reflected in the data gathering sessions, were also seen in formal test results. He obtained scaled scores of 13 and 11 respectively on the Comprehension and Picture Arrangement subtests of the WAIS-R, which might be considered to be reflective of good social judgement. His Full Scale intelligence quotient was at the 55th percentile and fell into the Average classification. The majority of Subject C's Verbal subtest scores were below average while the majority of his Performance subtest scores were average. Abstract reasoning was a relative strength for him.

His auditory memory skills appeared to be fairly depressed. His Digit Span scaled score on the WAIS-R was 6. His age score on the Detroit Auditory Attention Span for Unrelated Words was only 7 years 0 months, while his memory for Related Syllables (meaningful sentences) was considerably higher, at 10 years 3 months. There was still a discrepancy score of almost seven years when that score was compared to his chronological age of seventeen years.

The Malcomesius revealed some visual memory difficulty and evidence of residual problems in visual discrimination. His Digit Symbol (also a test with a visual memory component) scaled score on the WAIS-R was 7, a weakness relative to his own scores and when compared to the norming group. His Word Identification score on the Woodcock was at the 38th percentile and his Word Attack score at the 44th percentile. Grade scores on both subtests were less than two years below his grade placement. He applied phonics skills with success in general but obviously did not always know the rule (alkalee for alkali and rudily for rudely). At other times he did not seem to be able to correct by checking a word against his vocabulary and therefore went with the phonetically correct word which did not match the pronunciation of common usage (beetitude for beatitude or jiggle for giggle). His spelling errors were usually phonetic alternatives (foren for foreign, rite for right and pease for peace) while others were phonetic attempts (oreental for oriental). Subject C's Passage Comprehension percentile score on the Woodcock was 37. His grade score was in excess of two years below grade level.

In terms of Mathematics skills, Subject C's untimed WRAT score fell at the 47th percentile, and his Arithmetic subtest scaled score on the WAIS-R was 7. His Math percentage score on the latest evaluation at the time of the present study was 51 percent.

Subject C was rated as organized by both teachers who filled out the twenty-point questionnaire; however, the score of 40 which he obtained from his Math teacher was below the arbitrary quantitative cut-off point of 45 established when comparing overall numerical ratings to teacher descriptors. His Math teacher also qualified his descriptor by stating that, while Subject C organized his material, he was not neat and was easily distracted. His Industrial Arts teacher saw him as organized, assigning him a 69.

The Rods Task--Subject C

Sequentially, the subtask sequence of the Rods Task moved from Free Performance 1, or Trial 1; to Pairs Choice; to Free Performance 2, or Trial 2; to Final Choice; and then to Independent Test. Following the task, metacognitive questions were asked. Before the experiment began and after it was concluded, subjects were asked to name all the things they thought "mattered for bending."

Free Performance One

Subject C was unable to use the control-of-variables strategy in his first Free Performance Trial. He made eight tests and mentioned four variables while testing. He tested three variables using unconfounded tests: length, diameter, and base. He approached the task straightforwardly and interactively. It was his willingness to learn from his experimentation that in a sense threw him off making unconfounded tests. In doing a test for length, he controlled all variables but length, but positioned the weights in a parallel fashion, thus placing the weight closer to the tip of the shorter rod. This placement caused the rods to bend equally and led him to say, "I thought the longer one would bend more than the shorter one -

didn't seem to . . ."

He made confounded tests, being aware of testing more than one variable at a time, i.e., "still wondering if a shorter plastic is stronger than a longer metal," or "still finding out if thin metal is as strong as the plastic [material] - with this one the thickness is about the same - maybe a little bit more . . ."

He verbalized very clearly regarding his intentions and findings:

Subject C: What I was wondering if - what do you call those?

Examiner: Base

Subject C: With the base - if it would change any - being plastic or wood.

Examiner: And did it?

Subject C: No.

Even when doing a confounded test, he expressed his thinking in a straightforward manner: "Well I had a suspicion that the thinner the plastic - the weaker it is - that's what I thought would happen and it did." In this test Subject C did not take into account that the plastic rod was longer as well as thinner.

Pairs Choice

Subject C was able to accurately judge the better or unconfounded test in all the tests presented to him. His statements showing his reasoning described one or the other or both of the pairs and by the last explanation also discussed all the relevant variables.

Examiner: . . . Which is the best test to see if bases matter?

Subject C: This one because they're the same length and the same thickness and they're made outa - they're both wood. These two - they're the same length and the same thickness but one's metal and one's plastic.

Free Performance Two

Although he did the same number of tests as he did on his first Free Performance Trial, Subject C mentioned only three variables and did an unconfounded test of only one: diameter. Even though he got off to a good start in the experiment initially and did so well in the Pairs Choice, he seemed to feel at this stage that he was testing the comparative strength of the materials. He did not use a control-of-variables strategy.

Final Choice

Subject C made no errors in the Final Choice phase. He was required to answer yes or no to six questions which asked him to judge whether the examiner-displayed set of rods was a good test of a specified variable. His reasoning as to why he had made certain choices was clearly expressed.

Independent Test

When asked to construct a test of his own to show one thing which "mattered for bending," he had no difficulty setting up an unconfounded test of material. He used the terminology of the experiment to describe his test as one "to find out if material matters . . ." When asked why he chose those two, he replied, "They're the same thickness and the same length but different material and the bases are the same . . ."

Metacognition

Before the experiment began, Subject C could name two possible variables which might make a difference in bending: length and thickness. Following the Independent Test, he named four variables: material, width, length and base.

When asked if he had changed his mind about bending and if he had learned anything by doing the experiment, he commented directly on the comparative strengths of materials. The nature of his comments reflected how involved he had been in the task.

The Text Search Task--Subject C

The Text Search Task was divided into three parts. The first part consisted of an introduction of the materials, a demonstration of the principal features of the text (without describing their use), and an open-ended instruction to find the answer to a specific question. The second part was an elicitation phase which consisted of a three-part demonstration of text search strategies of varying efficiencies from which subjects were to select the best approach. The third part of the session was another open-ended question which permitted subjects to demonstrate any changes in strategy use.

Trial One

Subject C utilized a type 2 strategy and successfully found the answer to the first question posed to him. He found the entry, the wording of which was close to the topic given him, in the table of contents. He then examined the other entries to see if there was any listing which was closer to the one he had chosen. When he found none, he turned to the page where the chapter began. He then used primarily picture cues to assist him in locating the specific information which he read.

Demonstrations

When asked to select from the demonstrated approaches of locating the answers to two other questions, Subject C chose the most efficient strategy for both demonstrations. His explanations showed that he had seen the differences in the methods presented and they represented a summary of what the examiner had done.

Demo 1

Examiner: . . . Which of those three methods would you say would be the best that I used?

Subject C: The third way.

Examiner: Why?

Subject C: O.K. The first way you just sort of flipped through looking for pictures, um, and then you'd have to - once you'd seen some pictures then you'd have to look around - do a lot of reading and find out exactly what's - where you are and that type of thing. The second way you'd just looked in the first part - what's that called . . ?

Examiner: The table of contents.

Subject C: Table of contents, and ah - then you looked for what you were - the insect - body of insects - bodies and then you turned the page and, and that was the second way - the third way you found out exactly how many pages of information there were and that would be the best way.

Demo 2

Examiner: All right, which of those methods do you think was best?

Subject C: Ah - I think the third way was the best. Again, you were looking at the table of contents - and found the ~~page~~ that the plants were on and then you looked back to the glossary and um - you found like page 145 had more on it and you didn't know that with the other two ways - so then you realized there was more in the book than you originally thought.

In the latter example, Subject C shows that he recognized more than one value of the index. He did not stick to a single explanation but left himself open to new information.

Trial Two

Subject C was the only subject in the study for whom a type 3 strategy was clearly elicited from the demonstrations. Subject B also used the preferred strategy on his second trial but he did so only as a last resort. Subject C also showed that he understood the use of key words in his explanation.

Subject C: I look in the table of contents - Muscles used for breathing - here it says - Chapter Three - The Bones and Muscles - so I'd turn to page 79 and then go to the Glossary - and I could look - muscles or breathing - I guess.

Examiner: What are you doing now?

Subject C: Looking - I was looking for the heading - Muscles.

Examiner: Good.

Subject C: And it says - and breathing - so muscles and breathing page 94 and 95 and then I

> turn to page 94 and I would find out if the information is here.

Metacognition

In comparing his performance on the two trials and outlining what he had learned, Subject C's explanations were descriptive and clearly stated. He did not, however, reiterate all the advantages of the index which he had previously mentioned.

> Subject C: The first time I just looked at the table of contents and found out what - found the heading - of closest to what I wanted and then turned to that page and that was it - and then I learned that if you went to the table of contents and then to the index and found the word that you were looking for and got - the first way I'd have to read maybe ten pages and the second way I might only have to read about three pages.

In summary, Subject C knew what he had learned and he related his actions according to this newly acquired information.

The Errand Planning Task--Subject C

In the Errand Planning Task, the subject was essentially required to organize a list of errands. He was to decide which errands he would do, the times at which he would do them, and how he would get around from errand to errand. Sequentially, the subtest sequence was a Free Performance step in which he was given two opportunities, Trial 1 and Trial 2, to plan and verbalize his strategy; a series of three pairs of scenarios which he had to judge as to their relative efficiency; and another Free Performance Trial, or Trial 3.

Following the task, metacognitive questions were asked. Trials were compared by examining student references to movement, time and errands, and, for that reason, the discussions will be in terms of those three elements rather than a sequential description of performance of the task elements.

Movement

Subject C made his highest number of references to movement in the initial trial of the three trials of the Errand Planning Task. Although his total number of movement references moved from 17 to 14 and then back to 15 respectively, the number of specific movements mentioned showed a marked increase in Trial 3, after Subject C had judged the demonstrations. The increase from 5 and 4 in the first two trials to 13 in the final trial also showed more varied use of the types of movement possible. In the first trial, 58% of references were to walking while 42% were to taking the bus. In the second trial, 90% of references were to walking and only 10% to taking the bus. In the third and final trial, Subject C began to refer to travelling by bike and divided his movements into more evenly distributed proportions: approximately 30% walking, 46% by bus, and 15% on the bike. While his number of initial references indicated spontaneous use of movement references, Subject C was incorporating more references over time, both by his use of more specific references and by expanding to another means of transportation.

The average numbers of references for movement made by subjects of the present study were 16.71, 15 and 12.57 respectively for the three trials. Subject C made 17,14 and 15 references in relation to his movement while outlining his plans for accomplishing the errands.

Demonstrations

Subject C chose the preferred sequence on all three of the paired demonstrations. He recognized the obvious flaws in the first and third demonstrations. In explaining his choice for the second demonstration, he tended to perseverate on the reason he had given for the first demonstration; namely, waiting in the dentist's office. In so doing, he missed the obvious distance factors which made a more appropriate explanation for the scenario he chose.

Time

The demonstration phase of the Errand Planning Task seemed to elicit an improved strategy for Subject C. He made 7 references to time on each of the first two trials but increased his references to 10 on the final trial. The range of times increased with each trial.

Errands

Subject C seemed to use errand references spontaneously, doing 11, 12 and 12 of the thirteen possible errands respectively on the three trials of the Errand Planning Task. He omitted one errand each on Trials 1 and 3; he also rejected an activity on Trials 1 and 2. The rejected item was a favourite television show, showing an ability to priorize for a special occasion. He forgot to mention going to bed on the first trial and to walk his dog on the third trial.

Metacognition

Subject C's statement about what he learned from doing the Errand Planning Task was straightforward:

> Subject C: Well, if you have, like Saturday afternoon, and you've got to get so many things done - to think about what you're going to do and not just do it.

Subject C's reflection on his own planning and his comparison of his first and third plans was interesting. Although from the examiner's viewpoint, Subject C's third trial was his most efficient, Subject C saw his first plan as the best. Objectively speaking, Subject C increased his references to specific movement, time and errands in Trial 3. Also, when his routes were traced for the two plans, his last plan was far more direct, showing much less backtracking. In Trial 3, he did more errands along the way and did not travel back and forth the length or width of the map to accomplish an errand he could have done as he travelled between two other errands.

Subject C's view of the situation was quite different than the picture revealed by examining the evidence.

> Subject C: I think the first one was better 'cause I think I got more - like I walked the dog and I was home by quarter after ten - I mean quarter to eleven.
>
> Examiner: So you liked your first plan the best.
>
> Subject C: Yes.
>
> Examiner: For those reasons. Were there any other reasons why you thought it was best and why your last plan wasn't quite as good?

Subject C: No. No, that's the only reason.

He did shed more light on his reasoning, however, when asked what would be a good plan.

Subject C: Well, to find out how much you can get done in a certain amount of time.

Examiner: O.K.

Subject C: And get as much in as you can without - um - I think my second plan I was doing more running around than doing actual stuff. In my first plan I was doing more stuff in less amount of time.

In this explanation, as in his first, he seemed to be zeroing in on finishing fifteen minutes earlier on the first trial. His description of himself "running around more than doing actual stuff" was more in keeping with his actual performance on the first trial.

When asked to pick out differences between his first and last trial in his planning specifically, he described specific differences in how he carried out the errands rather than how he did the planning for them.

General Comments

Subject C examined the map and then the microphone during the initial reading of the scenario in Trial 1. Soon, however, he began to follow on his written copy what was being read by the examiner. He picked up the paper, centered it on the map, and began to use his pencil as a pointer as the list of errands was read, following each point with his eyes. He paused for only twenty-two seconds after beginning to describe his actions. He looked at the paper as he began and made at least twenty-nine intermittent references to the written scenario as he spoke. When speaking, he tended to move his fingers along the map while using verbs and to touch places he referred to directly.

He started the second trial immediately, checking off errands on the written scenario as he worked. The second trial was much smoother; he needed to ask fewer questions of the examiner and referred less often, just eight times, to the written list. He also was more familiar with the map, touching places and following roads in a smoother, more direct manner. At one point during the second trial, he studied the written copy before he continued with his explanation.

Trial 3 was started instantaneously. He needed to refer to the description on paper just three times. Gaining familiarity with the map, he tended to use increasingly general terms such as "here" and "there" for places.

The Self-Ordered Task--Subject C

The Self-Ordered Task consisted of organizing and carrying out a series of pointing responses. Each subject was required to touch pictures in a sequence according to a plan which he initiated and monitored. There was a high nonverbal visual memory component in the task.

Subject C worked quite quickly through the Self-Ordered Task. He ranked third in all but one of the sets in speed of completion. His set 12 was completed in just a bit over twenty seconds more than his set 6. Over half of that increase was between set 6 and set 8, with Subject C taking only three seconds longer to do set 10 than he had set 8 and approximately seven and one-half seconds more to do set 12 than set 10.

Subject C was fairly accurate, having only one set where errors exceeded any of the normed groups. His error score on set 8 was higher than the mean error score of the normal group but was lower than the mean error scores of both frontal lobe groups. His total error score was less than the total mean error scores of all three normative groups.

The Questionnaire On Organizational Skills--Subject C

Procedure

Transcripts of responses to the Questionnaire on Organizational Skills were examined for general impressions. The tone or feeling conveyed was described, the emphasized topics were discussed, and example quotations were extracted.

Using the transcriptions and themes from the twenty questions which made up the Questionnaire on Organizational Skills, subjects' responses were grouped into six separate organizational skills: general organization, planning, inspection, regulation, verification and correction. The use of examples and spontaneous utterances was examined, as well as the frequency of responses which were yes, no, or situation dependent. By quantifying these repsonses, subjects' performances across these organizational categories were examined and an attempt was made to see how subjects viewed themselves in terms of strengths and weaknesses as well as how those views compared to the descriptions of their teachers when those instructors answered the same questions.

Meaning units were also examined for preciseness. Descriptors were: word, comment and elaboration. Each of these descriptors was further categorized as general or precise. Statements were also examined to see if they reflected spontaneous replies or whether they were simply agreement/disagreement or parrotings of the examiner's words. In essence the majority of statements showed subjects' agreement or disagreement with a posed question. Thus, those so labelled were limited to words or comments which served no further purpose and gave the examiner no knowledge beyond if the behaviour was engaged in, not employed, or sometimes utilized.

General Tone

Subject C's responses were in the main detailed and descriptive of his task approach. He appeared to be outlining what he did actually do rather than what he thought he should do.

> Examiner: Do you compare the results of work with what you were supposed to do - that is, when you get all done, do you think about what the teacher told you you were supposed to do, or about the instructions?
>
> Subject C: No, not really. I guess I should, but . .

The detail of his responses seemed to reflect a knowledge of his task approach.

> Examiner: Do you make corrections that you notice by yourself - if you're doing something

and you see something that is wrong, do you make that correction without someone having to tell you to make it? If you notice it yourself . .

Subject C: (interrupts) Yeah, O.K., well, if I, I know I'm - O.K. - spelling a word and I know it's wrong, I'll underline it or indicate it somehow and change it and uh - sometimes I'll have other people read it over and see if it makes sense (pause) but usually if I'm satisfied with the work after reading it over a couple of times I'll just hand it in and go from there.

Examiner: Umhm. You said you underlined things; then what do you do with that?

Subject C: O.K. Well, umm, say I'm writing, I've gotten an idea to put in, then I'll write it down and if I, O.K., spelled a word wrong, then I'll underline it and then after I've finished the rough copy type of thing I'll go back and get it spelled right or the sentence rearranged or . .

Examiner: O.K. Sounds good. Do you think that you notice errors as you're working?

Subject C: About 50 - 50. (laughs)

He made two comments regarding his difficulty with reading. The first was in responding to a question regarding whether he felt directed or lost when doing an assignment. After he remarked that he felt lost in English, the following exchange took place:

Examiner: O.K. Why do you suppose that is?

Subject C: Umm, I don't know. Maybe it's (pause) I don't pay attention enough, or, uh, can't, I never could get into reading something anyway but . .

Later in the dialogue, more was revealed regarding his knowledge about his own learning.

Examiner:	O.K. What do you think the purpose of reading is?
Subject C:	Um, to learn what's going on around you and things that have happened or . .
Examiner:	Can you gain the same information through your ears as you can through reading?
Subject C:	I think so. I think for me I gain more through my ears as through reading something 'cause you know when I can talk it over and really understand it - whereas if I'm reading something and I don't really understand it, you know there's no trying to break it down. (laughs)

Subject C's transcripts yielded the following impressions:

1. That he conformed quite readily to the demands of the classroom.
2. That he had fairly precise knowledge of how he interacted and learned at school but did not know how he could improve his standing.
3. That his social skills were advanced and his conversational skills polished.

Self-Perception of Organizational Skills

In looking at Subject C's performance across six organizational skill areas, response patterns emerged. Examples came spontaneously with his answers, with very little probing for additional information necessary. Sixteen of his twenty responses were accompanied by example and fifteen of those spontaneously followed the examiner's first question (see Table 88). He also saw himself engaging in organized behaviours more often than not. He responded with a firm "no" to only one of the questions. He said he did not compare the results of his work with what he was supposed to do. Eleven of his responses were strongly affirmative with another eight indicating sometimes or situation dependent usage of a described technique.

By quantifying his responses as described in Steps Twelve through Fourteen of the precedure for analyzing the Questionnaire On Organizational Skills found in Chapter V of the present study, it was possible to ascertain Subject C's relative ratings of himself on the six organizational skills being examined. Through this step, it was seen that Subject C rated himself the lowest on the two organizational skills of General Organization and Verification. He rated himself most highly on Inspection and Correction skills.

Comparisons of Self-Perceptions With Teacher Perceptions

Subject C's quantified scores and relative rankings were then compared to how he had been rated by his Industrial Arts teacher and his Mathematics teacher (see Table 91). There was closer agreement between the results of the Industrial Arts teacher's ratings and the opinions of Subject C than between Subject C and his Math teacher. The Industrial Arts teacher rated Subject C lowest in Verification skills, as he had done himself. However, while Subject C rated his General Organization skills as equally low, the Industrial Arts teacher saw them as his strength. Subject C, on the other hand, rated himself most highly in Inspection and Correction skills.

There was no similarity between the way Subject C and his Math teacher saw his organization skills. In fact, they were directly opposed. The Math teacher rated Subject C as highest in General

Organization, where he saw himself as the least skilled, and lowest in Inspection, where Subject C rated himself most highly.

Both teachers described Subject C as organized, which was in keeping with his own generally high opinion of his organizational skills. In addition to the positive pattern seen in his grouped responses from the Questionnaire, Subject C described himself as fairly organized, stating that it depended on the circumstances. Comparatively, Subjects C and B shared the highest overall rating given by nonacademic teachers on the Questionnaire On Organizational Skills used in the present study. While Subject C's academic teacher used the descriptor "organized," his numerical rating was below the arbitrary cut-off for organized behaviour. He also made the comment: "The student does organize his material but is not very neat and is easily distracted."

Preciseness of Verbalizations

In examining each meaning unit for preciseness, it was found that Subject C's verbalizations were primarily in the category of precise elaborations (see Table 93). General comments made up the second largest group of verbalizations that he made. Seventy-nine percent of his statements were his own. That is, they were not composed of simple agreements/disagreements or parrotings of the examiner's words.

The Interview Regarding Study Habits--Subject C

Themes from Questions 3, 4, 6, 7 and 9 from the Interview found in Appendix J were examined and labelled as to whether they reflected the subjects' knowledge of their study and work habits or demonstrated their awareness of their ability to regulate those habits. Criteria for assignment of "knowledge of" or "regulatory" were adapted from Brown and Palinscar's 1982 discussion of metacognition and may be found in Table 95. In example, a verbalization identifying a research technique such as "looking it up in books" is a knowledge statement regarding study habits, while a subject saying that he "started [researching] early because I found I needed all the time I could get" shows a regulatory component.

Notation was also made when the subjects did not seem to know how they could intervene to change an ineffective habit. "Knowledge of" labels were further defined as general or specific. As well, total theme and spontaneous theme patterns were established by ranking the number of statements falling into the two "knowledge of" and the regulatory categories.

The stipulated sections of Subject C's transcript were divided into twenty-one themes. None of his statements reflected an inability to regulate actions or a lack of knowledge. Five of his statements were labelled as being more reflective of the examiner's ideas than his own.

In analyzing the themes and underlying transcripts of Subject C's responses in the Interview Regarding Study Habits, a pattern emerged (see Table 103). While "knowledge of" statements made up the largest subgroup of the total number of themes, a substantial proportion were "regulatory" in nature. In total responses only three more "knowledge of" statements were made than "regulatory". When examining spontaneous expressions only, one discovers that Subject C's themes fall into two equal groups of "knowledge of" and "regulatory" statements. The majority of his "knowledge of" statements were specific: twice as many of his total and three times as many as his spontaneous "knowledge of" expressions were specific as compared to general.

In summary, Subject C's verbalizations included large proportions of both "knowledge of" and "regulatory" statements. The majority of his "knowledge of" statements were specific. His total theme and spontaneous theme patterns were constant.

The examiner felt that Subject C was sincerely describing how he approached his work. He was aware of the contribution of his reading problem to his school problem but believed that if he had taken more time he might have overcome his reading problem. He felt this despite the years of special classes he had attended to assist him with his problems. He had resolved that something was wrong cognitively. His understanding of his own ability was made even more difficult by the fact that he did better than his classmates when he received special placement but not as well as others in the regular class to which he would be returned. The theme of "success in school being dependent on the effort exerted" carried through Subject C's responses. He repeated that he believed if he had put more effort into studying that his grades would have improved, but he felt he did not spend more time because the work lacked appeal. In reflecting on the performance of those who do well in school, once again he commented on the time they spent on their work.

Subject C was able to use detail in explaining how he would write an essay or study for an exam. His expressions were sometimes lacking in preciseness of vocabulary but reflected that he knew what he would do:

Examiner: Well, let's say I said to you, "Write a paper on the history of telephones."

Subject C: O.K., well then - like, I think I'd go way back to where it was just starting and I'm sure the encyclopedia would give a lot about it.

Examiner: . . . How do you use the encyclopedia?

Subject C: Well, I just look up the word . .

Examiner: O.K.

Subject C: And, well, whatever it is that I'm, like, if it's telephones, then I'd look up telephones, and, uh - read what it says and try to get, you know, take away the stuff that doesn't really need to be in there and just like the main facts like the years that it started and who thought it up and that type of thing.

Examiner: O.K. Sound~~s good.~~ All right, so you look up and read and try and get the main facts. Then what would you do?

Subject C: Write it down. Make sure it was long enough and got to the point, didn't drag on.

Subject C gave the impression that he was aware of his study habits and their effect on his learning. However, he seemed to feel that in his present school experience success or failure was totally his responsibility.

CASE STUDY BASED ON DATA COLLECTED FROM SUBJECT D

The Academic and Skills Assessment--Subject D

Subject D was fifteen years four months old during the initial data gathering and fifteen years eleven months of age during his final involvement with the present study. When he joined the study he was in Grade 10 and carrying seven subjects, four of which were academic. His overall average derived just prior to the initial data gathering was 55 percent. He obtained his highest grades in Math and Science, 68 and 62 percent respectively. He was failing Social Studies and Materials.

Subsequent to data gathering during the parental interview, it was found that Subject D had exhibited some CNS damage at birth, referred to by his mother as craniobifida. This information would have affected the exclusionary clause of the definition of learning disabilities had it been known earlier; however, no overt motor or language problems had been noted in the history.

Subject D appeared to be well aware of the nature of school demands and of the extent to which he was prepared to go to meet them. He gave the impression that while he was not doing particularly well in school it was largely because of a conscious decision which he had made in light of his intense dislike of reading.

All of Subject D's subtest scores on the WISC-R were average or above average when compared to the norming group except for his Coding score and the optional Digit Span score. His Full Scale intelligence quotient fell at the 73rd percentile and into the Average classification. His strengths relative to his own means were related to social interpretation and judgement. These abilities were reflected in a scaled score of 15 in each of the subtests of Comprehension and Picture Arrangement.

Subject D exhibited problems with the majority of the memory tasks which were presented to him. Weaknesses were noted in immediate auditory memory for digits. He obtained a scaled score of 6 on the Digit Span subtest of the WISC-R and could not retain dictated numerals on the Malcomesius. His age score for retention of related syllables or meaningful sentences on the Detroit was 10 years 0 months, somewhat higher than his age score for memory of unrelated words, which was 8 years 6 months. Some visual memory problems were evidenced on the Malcomesius, where he made copying errors, showed some difficulty recognizing words from distractor words after target words had been exposed and a brief delay imposed, and could not always revisualize simple words when asked to write them from auditory input. He also experienced difficulty with the retention of the nonverbal symbols used on the Coding subtest of the WISC-R, where his scaled score was 5.

Subject D made it clear as he was attempting the subtests of the Woodcock that he disliked reading and read only if he had to do so. He stated that when required to read for meaning he preferred to read aloud. He did not appear to push for achievement during the test. While his scores on both the Word Identification and the Word Attack subtests of the Woodcock fell at the 30th percentile, his Passage Comprehension score was only at the 7th percentile. Indeed, his Easy Reading grade score in Comprehension was at the third grade level.

Errors in Word Identification consisted primarily of omissions (magnese for manganese and expolate for expostulate) or substitutions and additions which retained the meaning of the word (judicial for judicious and reoccurrence for recurrence). He had a great deal of difficulty determining the number of syllables in auditorially presented words on the Fullerton, where his score on the Syllabication subtest was two standard deviations below the mean.

In most of the formal language assessment, Subject D was even with or below criteria or mean scores. While only slightly below the mean on the Divergent Production and the Grammatic Competency subtests of the Fullerton, his ability to produce Formulated Sentences on the CELF was considerably below criteria. However, his score met the expected criteria on the Processing Relationships and Ambiguities on the CELF, and his age score on the Verbal Absurdities subtest of the Detroit was just slightly above his chronological age at 15 years 6 months.

While Subject D's Arithmetic subtest scaled score on the WISC-R was 11, he obtained a score at the 30th percentile on the Mathematics subtest of the WRAT. His then most recent achievement score in Math, as mentioned previously, was his highest grade, at 68 percent.

Subject D was rated as organized by his Learning Assistance teacher, whose rating yielded a score of 47, and quite disorganized, with a score of 34, by his English teacher.

The Rods Task--Subject D

Sequentially, the subtask sequence of the Rods Task moved from

Free Performance 1, or Trial 1; to Pairs Choice; to Free Performance 2, or Trial 2; to Final Choice; and then to Independent Test. Following the task, metacognitive questions were asked. Before the experiment began, and after it concluded, subjects were asked to name all the things they thought "mattered for bending."

Free Performance One

Subject D was unable to use the control-of-variables strategy in the first Free Performance Trial. He made six tests and mentioned five of the expected variables while testing. He also spoke of the heaviness or lightness of the rods and in four of the six tests he referred to density, which he defined as "how closely packed the molecules are."

He tested two variables using unconfounded tests: base and length. Subject D approached the task with an air bordering on defiance. He felt that he knew all the things that mattered for bending and that the examiner's request to "show her what mattered for bending" was a bit of an insult to his intelligence. He asked, "Do you have to put them in there?", there referring to the stand. He felt, as he said, "Well I can sort of tell without . . ." He told what he thought mattered for bending and had to be urged to use the materials. After he completed his first test, he was asked what he found out from the pair, and he replied, "Nothing." When asked what made a difference for bending, he began to repeat the variables he mentioned previously. When asked to tell what made a difference for bending for the pair in the stand, he replied, "The rods - 'cause the weights are the same, put a heavier weight on - it bends almost the same . . ."

Subject D's "hurt" that the examiner would request that he test for knowledge that he believed he already possessed produced in him a closed attitude to the task. He did not interact with the materials or try to actively learn from them.

Pairs Choice

Subject D was able to accurately judge the better or unconfounded test in three of the five tests presented to him. His explanation for his choices were limited, poor logically, or irrelevant. For example, when selecting the best pair to test for length, he explained his selection by saying, "This is - but - that's - you can't really test 'cause that's plastic." When the examiner said O.K., he added, "You put plastic against wood."

On occasion the examiner needed to draw answers from him.

Examiner: Which of these would be the best test to see if material mattered?

Subject D: This one.

Examiner: Why?

Subject D: 'Cause the iron's a lot heavier . .

Examiner: Why wouldn't this be as good?

Subject D: The plastic is almost the same density as this.

Examiner: So which set is the best for finding out if material matters?

Subject D: [points]

Examiner: Do you want to tell me?

Subject D: What?

Examiner: Which set?

Subject D: This set.

Examiner: You pointed - you said that you'd tell me which set by describing it.

Subject D: The plastic and the iron rod.

Examiner: And your reason again?

Subject D: 'Cause the iron's the most likely a lot heavier - than the plastic - and the plastic is - well in this set - is probably almost as dense as the wood.

Free Performance Two

Subject D did not use a control-of-variables strategy in the second Free Performance Trial. He mentioned the same five variables he referred to in the first Free Performance Test, all but position of weight. Again six of his eight tests included a reference to density, which he defined almost in the same way he had initially: "How tightly packed the molecules are - um - um - how compact it is . . ."

Although he was less resistant to experimenting than he had been initially, he still behaved as though the exercise was more one of explaining what he knew than it was an opportunity for him to learn. He was more descriptive in Trial Two than he had been in Trial One. He made no unconfounded tests in the second Free Performance Trial.

Final Choice

Subject D made only one error in the Final Choice phase. He was required to answer yes or no to five questions which asked him to judge whether the examiner-displayed set of rods was a good test of a specified variable. His explanations as to his decisions grew more descriptive through Trial Two and into the Final Choice.

Independent Test

When asked to construct a test of his own to show one thing which "mattered for bending," he was unable to do so. His Independent Test was a test of base confounded by diameter.

Metacognition

Prior to the first Free Performance Trial, Subject D named four possible variables which made a difference for bending. He included density reducing the number of relevant variables to three: length, diameter, and weights. Following the Independent Test, he named five variables. When density was excluded, the relevant variables added to his previous list were material and base. He did not mention weights in his final listing.

When asked if he had changed his mind from his initial position or if he had learned anything from doing the experiment, he replied "probably" to the first question. In response to the second query, he said:

> I don't know. I really didn't notice a change - but I did change my mind once or twice - or a couple of times - over there - ah. .

Even at this point, although he had relaxed his defensive position throughout the experiment, he seemed to feel that it was important to point out that he had understood what the examiner was getting at from the beginning.

The Text Search Task--Subject D

The Text Search Task was divided into three parts. The first part consisted of an introduction of the materials, a demonstration of the principal features of the text (without describing their use), and an open-ended instruction to find the answer to a specific question. The second part was an elicitation phase which consisted of a three-part demonstration of text search strategies of varying efficiencies from which subjects were to select the best approach. The third part of the session was another open-ended question which permitted subjects to demonstrate any changes in strategy use.

Trial One

Subject D used a modified type 3 strategy spontaneously. The strategy was termed modified in that the subject utilized the index but not the table of contents. He listened to the question, grasped the book, and immediately opened it to the index. He then read until he found the appropriate key word and turned to the correct page. He was very efficient and matter-of-fact in the way he approached the task.

Demonstration

Subject D was the first subject asked to complete the Text Search task and was asked to judge only one set of demonstrations. When asked to select from the demonstrated approaches of locating an answer to a question, he chose the most efficient.

Examiner: Which of those three methods was best?
[Summarizes the methods.]

Subject D: The index.

Examiner: Why?

Subject D: Well, it depends - like if you're say you're in class and you just want to screw around the whole class - flip through it - if you want to get the answers done fast, you look in the index.

Trial Two

Despite his low reading ability as measured on standardized tests, Subject D handled the text in a relaxed, familiar way. He once again used a modified type 3 strategy. His initial use of the preferred strategy had classified him as a spontaneous user.

Examiner: Using the book again, see if you can find what the book says about saving electricity. [Pause while Subject D silently opens the book to the index and reads to himself.] What did you do? You need to talk.

Subject D: Oh! Was looking up electricity. Electrical - electrical circuit - electrical current - electricity - and then the subheadings - electrical saving.

Examiner: What page is it on?

Subject D: 252, 253, 254, 255 and 256 - 252.

Subject D made no attempt to incorporate use of the table of contents, which was part of the demonstration which he referred to as the most efficient during the elicitation phase. Although he regulated his actions by his previous knowledge, he made no attempt to modify his actions by newly acquired information.

Metacognition

No metacognitive questioning was completed for Subject D on the Text Search Task.

The Errand Planning Task--Subject D

In the Errand Planning Task, the subject was essentially required to organize a list of errands. He was to decide which errands he would do, the times at which he would do them, and how he would get around from errand to errand. Sequentially, the subtest sequence was a Free Performance step in which he was given two opportunities, Trial 1 and Trial 2, to plan and verbalize his strategy; a series of three pairs of scenarios which he had to judge as to their relative efficiency; and another Free Performance Trial, or Trial 3. Following the task, metacognitive questions were asked. Trials were compared by examining student references to movement, time and errands, and for that reason the discussions will be in terms of those three elements rather than a sequential description of performance of the task elements.

Movement

Subject D's references to movement in general as well as his references to specific movement showed steady increases from trial to trial over the three trials of the Errand Planning Task. The percentage of references attributed to mention of a specific movement also increased from 56% in Trial 1 to 58% and 61% in Trials 2 and 3 respectively. Just redoing the task in Trial 2 elicited greater improvement than subsequently judging the demonstration, with an increase of 2 references from Trial 1 to Trial 2 as compared to an increase of 1 reference from Trial 2 to Trial 3. These differences are not discrepant enough to indicate a clear direction as to which procedure elicited the more efficient subsequent performance.

He referred to walking, the bus, and his bike but used the bike only once in each of his first and third trials. Walking was incorporated the most: 40, 57 and 50 percent of the references in Trials 1, 2 and 3. The bus was next: 40, 43 and 38 percent of the references.

Demonstrations

Subject D chose the preferred sequence on all three of the paired demonstrations. In explaining his choices, he gave logical and acceptable reasons, including the importance of proximity of places, not repeating trips, and of doing things along the way. His recognition of the need to cluster errands is seen in the following excerpts from the second demonstration.

Examiner:	. . . Which of those is best?
Subject D:	Coming home from school - going to home - studying for an hour and going over there to the record shop and going to the restaurant.
Examiner:	Why?
Subject D:	'Cause it's not as long or is this goin' from there all the way down here all the way back up.
Examiner:	K. Any other reasons why it's better?
Subject D:	It's just shorter and ah - like there's no use - that one - the record store and the drive-in's close together - well -

> grandparents is - depends how close together - but you don't really have to go to your grandparents, you can go there tomorrow - unless you really have to be there today.

In the third demonstration he had also stressed the link between movement and ~~accomplishing~~ errands. He said, after choosing the preferred sequence:

> Subject D: Well, you're comin' to the library - drop your book off - then go to the record store - and everything - your record, your chips and go home - whereas go to the library - going to this cafe - and then goin' to there - it's just as good to drop 'em off when you come - rather than goin' there twice - plus this way it's almost - it's closer to home than goin' all the way down here again - um and drop 'em off here - first one's easier.

He had recognized the clustering element in the first demonstration but was not as aware of the more obvious time factor. In the first demonstration the least preferred sequence has the student going to his 4:30 p.m. dentist appointment as soon as school is out at 1:30 p.m. While he did not choose that sequence, he did not verbalize the poor use of time as one of the reasons for not choosing it until asked ~~if there~~ were other reasons for his choice. Even then he only inferred the wait.

> Subject D: No, the second one.
>
> Examiner: Why?
>
> Subject D: 'Cause you're goin' this way, you're going by everything and then you're going home. This one you got to go all the way

and you're not goin' by anything.

Examiner: O.K.

Subject D: Like, you didn't drop off - you didn't drop the record off, you didn't go for a burger - or something - you just went all the way over to the dentist - the long way - went to the grocery store - or the dentist's - then to the grocery store . .

Examiner: Anything else about the first one that seems a bit peculiar?

Subject D: Well, you took the bus all the way up here - you didn't stop off for that record store - the drive-in - the library - went straight to the dentist (mumble) was 4 - 4:30 - something like that.

Time

Subject D made more time references than any other subject in the present study: 12, 14 and 13 respectively on Trials 1, 2 and 3. His greatest number of references were in Trial 2, indicating that simply redoing the task may have elicited a better performance. However, since the total number of references per trial are so close, any such supposition is difficult to make. Subject D spontaneously used time references before any attempt to elicit such references were made.

Errands

Subject D did 10, 10 and 12 of the thirteen errands in the three trials of the Errand Planning Task. In the first trial, he omitted two errands and rejected one. He outrightly rejected studying on Trials 1 and 2 and only studied a half hour in the third trial. Indeed, even before he began Trial 1, he interjected, "Do I have to study?" In Trial 1 he forgot to mention that he went to the party and going to bed. On Trial 2, in addition to rejecting the period of study, he omitted taking the baking to his grandparents and only inferred that he went to the party. On Trial 3, he did all the errands but one, having a snack, and that was inferred.

Metcognition

As an oversight, no metacognitive questioning was done on the Errand Planning Task with Subject D.

General Comments

Subject D picked up the written copy of the scenario as soon as the examiner completed her instructions. He appeared to recognize the importance of the account and asked, "Do I follow this list the way it's written there?" While thirty-two seconds passed between the end of the examiner's directives and his commencement of verbal planning on Trial 1, Subject D asked questions during that time which helped him to understand the task. Discussion filled almost the entire period. He began Trial 2 immediately of his own volition, asking, "Can I do it all over again?" It took him about twenty seconds after the examiner's directive before he began the third trial.

He referred to the paper as he outlined his sequence, keeping the paper in one hand while pointing with a pencil in the other. He tended to pause between statements as he looked at his paper. He followed this pattern in all three trials. However, he put the paper on the map in front of him part way through the third trial.

He touched the map with his pencil as places were mentioned in his description. Initially, in Trial 1, he did not follow the routes but just lifted his pencil from place to place. In Trial 2, however, he began to follow the routes he was describing and continued that pattern into the third trial.

He seemed aware of the requirements of the task and sought confirmation of his perceptions. For example, beginning Trial 3 he said, "Ah - you want the times?"

The Self-Ordered Task--Subject D

The Self-Ordered Task consisted of organizing and carrying out a series of pointing responses. Each subject was required to touch pictures in a sequence according to a plan which he initiated and monitored. There was a high nonverbal visual memory component in the task.

Subject D worked very quickly through set 6, almost doubled his time for set 8, kept his time almost the same for set 10 as it had been for set 8, and then dropped about three and one-half seconds off his set 10 time in set 12. His speed rankings were 2, 5, 4 and 3 (See Table 56).

Subject D made significant numbers of errors in each set (see Table 57). In set 6, his error score was higher than the mean error score of the normal group but lower than the mean error scores of both of the frontal lobe groups. His error scores on sets 8 and 12 exceeded the mean error scores of all normative groups. In the case of set 10, Subject D's error score equalled that of the mean error score of the right frontal lobe patients and was higher than the mean error scores for the normals and left frontal lobe patients. His total error score was higher than the total mean error scores of the three groups: normals and both frontal lobe groups.

Interestingly, Subject D was reported as having been born with central nervous system damage. It had been the intention of the examiner to exclude such subjects from the study; however, as no mention of the birth abnormality appeared in the cumulative folder, his condition was not known until after his inclusion in the study.

The Questionnaire On Organizational Skills--Subject D

Procedure

Transcripts of responses to the Questionnaire on Organizational Skills were examined for general impressions. The tone or feeling conveyed was described, the emphasized topics were discussed, and example quotations were extracted.

Using the transcriptions and themes from the twenty questions which were made up on the Questionnaire on Organizational Skills, subjects' responses were grouped into six separate organizational skills: general organization, planning, inspection, regulation, verification and correction. The use of examples and spontaneous utterances was examined as well as the frequency of responses which were yes, no, or situation dependent. By quantifying these responses, subjects' performances across these organizational categories were examined, and an attempt was made to see how subjects viewed themselves in terms of strengths and weaknesses as well as how those views compared to the descriptions of their teachers when those instructors answered the same questions.

Meaning units were also examined for preciseness. Descriptors were: word, comment and elaboration. Each of these descriptors were further categorized as general or precise. Statements were also examined to see if they reflected spontaneous replies or whether they were simply agreements/disagreements or parrotings of the examiner's words. In essence the majority of statements showed subjects' agreement or disagreement with a posed question. Thus, those so labelled were limited to words or comments which served no further purpose and gave the examiner no knowledge beyond if the behaviour was engaged in, not employed, or sometimes utilized.

General Tone

Subject D's responses were to the point and specific. They did not always reveal good task approach but gave a fairly clear picture of how Subject D behaved in the classroom. While his verbalizations were usually classified as precise, they reflected that Subject D appeared to know more about the superficial aspects of learning than the detailed.

> Examiner: What do you do after the teacher gives you an assignment? First time they give you the instructions, what do you do?
>
> Subject D: Well, she writes it down on the board, I copy it down and read it over a couple of times and make sure - and ask questions if I don't understand something, ask a question. That's about it.

Another example of this more superficial knowledge follows. While Subject D knows what he would do, the information he relates reveals little about his interaction with the assignment.

> Examiner: O.K. Do you start things right away?
>
> Subject D: Sometimes. Other times I just sit and talk.
>
> Examiner: And what is that dependent on? The way you would do it?
>
> Subject D: Whoever - like - the majority of the class - like, if everybody's working, I'd work and if everybody's talking I'd sit there and talk.

This tendency to discuss factors other than those inherent in the task persisted and were often reflective of Subject D's tendency to assert his rather rebellious approach.

> Examiner: Do you make corrections that you notice yourself? Say you're working on something, you see you've spelled a word wrong or something. Would you correct that?
>
> Subject D: Depends how I feel that day. If I'm tired or mad or something, I'd just say, ah, I'll just leave it until tomorrow or something.

In discussing autobody, however, the degree of specificity of his comments increased. In replying to the examiner's inquiry as to whether he noticed errors as he went along he replied:

> Yeah, in English, I'd just read it over and see how it looks and in Body - let's say I'm pulling on the (unintelligible) I'd just run my hand over the metal and see how it's coming out - and if it's - if the dents are coming out or if it's stopped and still not budging.

Subject D's transcripts yielded the following impressions:

1. That he did not wish to conform to the demands of the classroom and would like to give the impression that he worked when and how he chose to work.
2. That his knowledge of how he learned at school was not as precise as how he intereacted at school.
3. That his reported knowledge was fairly detailed but often did little to inform the researcher of his task approach.

Self-Perception of Organizational Skills

In looking at Subject D's performance across six organizational skill areas, response patterns emerged. He approached the dialogue in a cut-and-dried manner, elaborating easily but keeping his responses fairly succinct. Fifteen of his twenty responses were accompanied by example and twelve of those had spontaneously followed the examiner's first question (see Table 88). He saw himself engaging in organized behaviour frequently. He responded with a firm "no" to only two questions. He stated that the did not plan out assignments and did not proofread his work. He also insisted that he did not set priorities when doing a series of tasks but, as his examples of his actions revealed priorizing, his comment was rated as situation dependent. Nine of his reponses were strongly affirmative with another nine indicating "sometimes" or situation dependent usage of a described technique.

By quantifying his responses as described in Steps Twelve through Fourteen of the procedure for analyzing the Questionnnaire On Organizational Skills found in Chapter V of the present study, it was possible to ascertain Subject D's relative ratings of himself on the six organizational skills being examined. Through this step, it was seen that Subject D rated himself the lowest on the organizational skill of Regulation. He rated himself most highly on General Organization and Inspection skills.

Comparisons of Self-Perceptions with Teacher Perceptions

Subject D's quantified scores and relative rankings were then compared to how he had been rated by his Learning Assistance teacher and his English teacher (see Table 91). There was only one area of agreement in those comparisons. That was that both Subject D and his English teacher rated him most highly in General Organization skills. However, the English teacher viewed Subject D's Inspection skills as his weakest area, while Subject D had related Inspection as highly as General Organziation.

There was no commonality between the Learning Assistance teacher's ranked ratings and those of Subject D. The Learning Assistance teacher saw his strongest area as Planning and Subject D was rated lowest in Correction skills in this less academic setting.

Subject D's opinion of himself as "sometimes I'm organized, sometimes I'm not" seemed to be reflected in the teacher's general ratings of him. He was rated as organized by the Learning Assistance teacher but his score was in the less clearly defined range between organized and disorganized. He received a disorganized rating by this English teacher.

In further description Subject D's English teacher wrote:

> ________ is far more interested in talking to his friends than he is in doing work. He will

> allow-- any distraction to take him from his work. ________ is not "successful" in written work, and reading is not easy for him I suspect, as well. Writing is a painful process for ________.

This distractible tendency was also described by his Learning Assistance teacher:

> ________ worked in spurts for short periods of time (15-20 minutes), but found it difficult to concentrate on anything for extended periods of time.

Preciseness of Verbalizations

In examining each meaning unit for preciseness, it was found that Subject D's verbalizations were primarily in the category of precise elaborations (see Table 93). This fact seems to be somewhat at odds with the lack of detailed information gained regarding Subject D's task approach. However, his verbalizations give detailed, if superficial, information regarding his actions.

Sixty-nine percent of Subject D's statements were his own. That is, they were not composed of simple agreements/disagreements or parrotings of the examiner's words.

The Interview Regarding Study Habits--Subject D

Themes from Questions 3, 4, 6, 7 and 9 from the Interview found in Appendix J were examined and labelled as to whether they reflected the subjects' knowledge of their study and work habits or demonstrated their awareness of their ability to regulate those habits. Criteria for assignment of "knowledge of" or "regulatory" labels were adapted from Brown and Palincsar's 1982 discussion of metacognition and may be found in Table 95. In an example, a verbalization identifying a research technique such as "looking it up in books" is a knowledge statement regarding study habits, while a subject saying that he "started [researching] early because I found I needed all the time I could get" shows a regulatory component.

Notation was also made when the subjects did not seem to know how they could intervene to change an ineffective habit. "Knowledge of" labels were further defined as general or specific. As well, total theme and spontaneous theme patterns were established by ranking the number of statements falling into the two "knowledge of" and the "regulatory" categories.

The stipulated sections of Subject D's transcript were divided into twenty-four themes. None of his statements reflected an inability to regulate actions or a lack of knowledge. Only three of his statements were labelled as being more reflective of the examiner's ideas than his own.

In analyzing the themes and underlying transcripts of Subject D's responses in the Interview Regarding Study Habits, a pattern emerged (see Table 103). Subject D's themes were almost entirely labelled "knowledge of". Only two of his twenty-four themes reflected "regulatory" components. The "knowledge of" statements themselves were equally distributed between specific and general descriptors when all statements of that category were considered. When the data was examined in terms of spontaneous expressions only, no appreciable difference in pattern was seen from the previously described one.

The number of spontaneous "knowledge of" specific and "knowledge of" general themes differed by only one.

In summary, Subject D's verbalizations were almost entirely "knowledge of" statements, of which specific and general subcategories were equally represented. The total theme and spontaneous theme patterns were similar.

The examiner felt that Subject D was trying to uphold a carefully built image as he responded to the questions. Teachers had told him, so he reported, that he was uncaring. When asked in an earlier part of the Interview if anyone had ever told him that he was intelligent, he replied:

> Subject D: Oh, yeah! There were always teachers, you know, they say I got - I have - the potential to learn, it's just that I don't want to learn, they said.

Subject D seemed to have internalized that concept of indifference and went on to emphasize it but was careful to stress his love of autobody--where things were different.

> Examiner: So, knowing you had good intelligence was no news to you.
>
> Subject D: No, well I know all I got. It's just, I don't want to learn. Oh, some classes I don't want to - but there's autobody - I like it and I spend extra time in there and learned.
>
> Examiner: You're doing really well in that. I was looking through your records and the teacher says you're really very close to the top of the class.
>
> Subject D: Uh, huh.

Examiner: That's good. O.K. You've got good intelligence but you have some difficulty in school. You just said that people tell you that it's because you don't put enough effort in. Is that what you think?

Subject D: I've got so - I know I have but - a lot of teachers have told me that I've got - I just have the attitude I don't care.

Examiner: What do you think of that statement?

Subject D: Well, I know I do because, you know, say I got English homework through the years . .

Examiner: [to clarify] So, is it not caring that's at the bottom of it, do you think?

Subject D: Uh huh, I just want to get my credits in English and pass and that. Get my diploma. But the main thing is my autobody, I want to go for.

Subject D made it clear that he did not read unless he had to do so in order to make something. In general he stressed that he did as little as possible in all his academic work, i.e., "I never really studied hard for a test." Even for his autobody which was his major interest, he said he only studied during commercials while he watched T.V.

In describing how he would research an essay, he began by saying, "Well, I usually just leave it until the deadline . ." In the same discussion, he stressed that he knew how one was supposed to take notes while reading (take down some points about each paragraph) but that he just reads and rephrases. This defiance of sorts of the "system" continued throughout his verbalizations. There was a strong sense that he would do things his way despite his knowledge that another way was preferred and despite the fact that the repercussions for him using his approach might not be favourable.

This attitude extended even to his reading problem. When asked how he thought his difficulty with the printed word had contributed to his school difficulty, his responses indicated that he recognized the longstanding problem but at that present time was simply avoiding having to read.

> Subject D: . . . I don't know, I just don't want to take the time to - Sometimes, you know, I'd sit down and read, read it, because you know, I got nothing better to do. But, usually, like in class, we talk, so you know, I put the paper aside and talk.

CASE STUDY BASED ON DATA COLLECTED FROM SUBJECT E

The Academic And Skills Assessment--Subject E

Subject E was nineteen years one month old during the initial data gathering and was nineteen years eight months of age during his final involvement with the present study. When he joined the study, he was in Grade 12 and carrying four subjects, one of which was academic, and another modified academic. His marks in Facts of life and Physical Education were excellent, 93 and 85 percent respectively. He was failing his English with a grade of 35 percent. His overall average of 67 percent was not reflective of the grave difficulties he was having establishing the most elementary basic skills.

Subject E had numerous characteristics of developmental dyslexia. Despite his average intelligence, as measured by the WAIS a year previously, his scores on all achievement tests were very low.

His WRAT Arithmetic score was at the 7th percentile. Although he reached the 16th percentile on the Word Attack subtest of the Woodcock, his scores on both the Word Identification and Passage Comprehension subtests fell at the 1st percentile. Thus his difficulties extended across all symbol systems.

Subject E read at a very slow rate, sounding each word. He had difficulty sound blending. Subject E engaged in audible sounding and read aloud when requested to read passages silently. Despite this laborious approach to reading, Subject E did not become discouraged. He persisted in attempting word after word or passage after passage even though he was given several opportunities to discontinue. Indeed, if, when after encouragement, he left an item temporarily, he always insisted on coming back to try it again later. He simply would not give up.

Some of his word identification errors indicated that he was guessing on the basis of general configuration as well as initial and final consonants (wearing for warning, confront for comfort and dowl for drawl). He did not always monitor his errors for meaning (breadcast for broadcast) nor were medial portions always observed even for configuration (groovy for gruffly). His visual memory for word patterns was very poor when he was asked, after a delay, to reproduce a word or a phrase exposed for a short period. He had the same difficulty recalling and reproducing digits. While it was evident that he had difficulty revisualizing the exact letters he had seen (perent for parent and sill for still), he also left some words or parts of words and portions of numbers blank (bloo for blooming dandelions and 845-6 for 845-639). His ability to revisualize number strings from an auditory input appeared to be satisfactory; however, he could not recall the visual pattern of words he heard (vast foron combulsion for vast foreign complication and depuling with bubbly wather for dabbling with bubbling water). He had some difficulty recognizing words from distractor words after the target word had been exposed visually or presented orally and a brief delay imposed. Residual problems in visual discrimination were also noted. For example, he matched innuenbo with innuendo.

Subject E retained meaningful sentences more easily than unrelated words, achieving scores of 13 years 9 months and 10 years 8 months respectively on measures of those skills as presented on the Detroit. His ability to analyze the number of syllables in words and sentences as measured on the Syllabication subtest of the Fullerton was more than one standard deviation below the mean.

Subject E scored above expected criteria on the Processing Relationships and Ambiguities as well as the Producing Formulated Sentences subtest of the CELF. He also obtained a score of one standard deviation above the mean on the Grammatic Competency of the Fullerton. He had some difficulty, however, when he was asked to name as many items as possible which could fall into a specified category within a twenty-second time frame.

Subject E was rated organized by his Facts of Life teacher with a score of 52, and disorganized with a score of 43 by his English teacher when they completed the twenty-point questionnaire. The English teacher qualified her rating by saying, "Disorganized in my class. He does much better elsewhere, I gather." His Facts of Life teacher added, "___________'s written assignments are very difficult to understand if he does not get additional help with the spelling."

Subject E was an athlete of some accomplishment. His achievements in Physical Education in general and in Track events in particular gave him a sense of pride and an elevated status among his peers. In the opinion of the examiner, his successes in these areas gave him the courage to face continuing on with his schooling. He had a desire to do post-secondary work in physical education at a small college and was determined to complete his Grade 12 so that he might do so. During the last period of data collection, Subject E had enrolled in academic courses which would give him the prerequisites necessary for his future studies.

The Rods Task--Subject E

Sequentially, the subtask sequence of the Rods Task moved from Free Performance 1, or Trial 1; to Pairs Choice; to Free Performance 2, or Trial 2; to Final Choice; and then to Independent Test. Following the task, metacognitive questions were asked. Before the experiment began, and after it concluded, subjects were asked to name all the things they thought "mattered for bending."

Free Performance One

Subject E was unable to use the control-of-variables strategy in the first Free Performance Trial. He made six tests and mentioned four of the expected variables while testing. He also spoke of the mass of the rods which he defined as "different molecules that make up the metal." He utilized no unconfounded tests but did seem to be engaged in a search for the things which mattered for bending.

Pairs Choice

Subject E was able to accurately judge the better or unconfounded test in four of the five tests presented to him. His explanations lacked preciseness. The examiner initially needed to draw out information which was not offered spontaneously.

Examiner: Would that pair or would this pair be better if you wanted to find out if thickness [mattered for bending].

Subject E: (Points) ____________

Examiner: Pair on the (unintelligible)? Why?

Subject E: Because they're both exactly the same, they're made out of the same stuff - almost the same length and you couldn't tell because you could stick 'em on the end but you wouldn't be able to tell. Different substance is metal.

Examiner: These are different substances so what was your reason for choosing this one again?

Subject E: 'Cause they're made of the same material - everything's the same on them.

Examiner: What's - when you say everything?

Subject E: Well, the base is the same - the rod is made of the same material except that is thinner on that thing.

Examiner: So which were the things that were the same again?

Subject E: The base and the rod are all made out of plastic.

On occasion he came out with more succinct comments reflecting understanding: "You can't test two different materials to try to get to see what one is better - long or short." However, this statement followed another interactive exchange between the examiner and the subject which had attempted to draw out more precise language from him.

Free Performance Two

Subject E did not use the control-of-variables strategy in the second Free Performance Trial. Indeed, he made no unconfounded tests. He referred to only two variables, material and length, in his tests, two fewer than his Trial One. He also only wished to do only three tests, arguing that any further tests would just be the same as the ones he had already done.

His verbalizations were even less specific than in the first Free Performance Test. Attempts to draw out further information usually led to comments about varying materials.

Final Choice

Subject E made no errors in the Final Choice phase. He was required to answer yes or no to five questions which asked him to judge whether the examiner-displayed set of rods was a good test of a specified variable. His explanations were short and he was able to point out the similarities and differences in the rods which corresponded to the decisions he made.

Independent Test

When asked to construct a test of his own to show one thing "which mattered for bending," he was able to do so. His example was an unconfounded test of base.

Metacognition

Prior to the first Free Performance Trial, Subject E named two possible variables which made a difference for bending: length and position of weight. Following the Independent Test, he named eight variables. Four were legitimate: material, length, thickness and weight. He also included rod strength, security in base, mass and gravity.

When asked if had changed his mind from his initial position or if he had learned anything from doing the experiments, he replied: "I just said the weights - the length, the width and there's a lot more.

The Text Search Task--Subject E

The Text Search Task was divided into three parts. The first part consisted of an introduction of the materials, a demonstration of the principal features of the text (without describing their use), and an open-ended instruction to find the answer to a specific question. The second part was an elicitation phase which consisted of a three-part demonstration of text search strategies of varying efficiencies from which subjects were to select the best approach. The third part of the session was another open-ended question which permitted subjects to demonstrate any changes in strategy use.

Trial One

Subject E utilized a type 2 strategy and successfully found the location of the answer to the first question posed to him. He had some difficulty retaining the question while he worked. First he found the table of contents and located a key word and a page number. He relied heavily on pictures and verbalized that he was actively searching for pictures which would tell him he was close to locating the answer. He then read the text until he located the answer specifically.

Demonstrations

When asked to select from the demonstrated approaches of locating the answers to two other questions, Subject E chose the type 3 strategy for both demonstrations but vaccilated on his decision on the second demonstration between type 2 and type 3 strategies. His first verbalization reflected very little of his thinking, and while his second explanation was longer it showed that he had grasped little of the value of using the index.

Demo 1

Examiner:	O.K., which of those three methods do you think was the best?
Subject E:	The last one.
Examiner:	Why?
Subject E:	'Cause it was quicker.
Examiner:	Any other reason?
Subject E:	Ah - mmm (pause).

Demo 2

Examiner:	Which of those is the best?

Subject E: The third one.

Examiner: Why?

Subject E: 'Cause - ah - maybe the second one - the second and the third one were both good 'cause they get you to the chapter you found it and you still flipped through it - the time you waste looking in the back you could just flip (mumble) but this [is] better 'cause if it's not printed out big you won't catch it the other way.

Trial Two

Subject E did not use a type 3 strategy on his second trial and was therefore classified as strategy absent as he had not used the preferred strategy on either trial. He used much the same procedure he had in Trial One but did more skim reading.

Metacognition

In comparing his performance on the two trials and outlining the differences that he perceived, Subject E seemed to be quite aware that he had made no changes. As well, he was cognizant of the fact that he relied heavily on pictures. He said that he usually looked for pictures and added, "Instead of read, I look for pictures."

Although he described accurately what he had done: "I looked at the front on both, turned to the section and sort of flipped through it." [Examiner: O. K.] "Skimmed and looking at pictures, I guess.", he identified the thing he had learned from doing the task to be the value of a type 3 strategy.

Subject E: Yeah, you can use the back to find out - the index - to find out about where things in the chapter instead of flipping through.

In spite of the fact that he recognized the value of the type 3 strategy, he evaluated his type 2 approach as effective.

Examiner: Do you think that your method is a good method?

Subject E: I guess. It works.

In summary, Subject E said he had learned the value of the index but never demonstrated its use. Thus he seemed to know what he had learned but did not regulate his actions accordingly.

The Errand Planning Task--Subject E

In the Errand Planning Task, the subject was essentially required to organize a list of errands. He was to decide which errands he would do, the times at which he would do them, and how he would get around from errand to errand. Sequentially, the subtest sequence was a Free Performance step in which he was given two opportunities, Trial 1 and Trial 2, to plan and verbalize his strategy; a series of three pairs of scenarios which he had to judge as to their relative efficiency; and another Free Performance Trial, or Trial 3. Following the task, metacognitive questions were asked. Trials were compared by examining student references to movement, time and errands, and for that reason the discussions will be in terms of those three elements rather than a sequential description of performance of the task elements.

Movement

Subject E's references to movement in general and to specific kinds of movement both declined progressively from trial to trial. For example, specific references dropped from 14 to 10 and then to 7. He increasingly used his bike more often but varied in his use of the bus, with no use in Trial 2 and a slight increase in use for Trial 1 to Trial 3. References to walking dropped in each trial but made up the largest percentage of specific referents in Trial 2. By Trial 3 he mentioned walking only once as compared to nine references in Trial 1. Subject E seemed to make references to movement quite spontaneously. Redoing the task or judging the demonstrations brought no further increase in general or specific references.

The average number of references made by subjects of the present study were 16.71, 15 and 12.57 respectively for the three trials. Subject E made 17, 14 and 7 references in relation to his movement while outlining his plans for accomplishing the errands.

Demonstrations

Subject E chose the preferred sequence on all three of the paired demonstrations. He recognized the obvious flaws in the less preferred scenarios. For example, in the first sequence he recognized the difficulty in going for his dental appointment too early even though he had some difficulty figuring out just how early he would be.

> Subject E: They're both - that one's good 'cause you get the chips there but it's sort of a waste of time going all the way up there. You should have went here and then there and then all over. Actually, I guess one up there - the first one.
>
> Examiner: Why?

> Subject E: 'Cause you're not wasting time going all the - back down here where the part is when you're already up at your house and you gotta go to the dentist.

Time

Subject E made more time references each time he planned his day of errands. His tallies were 5, 8 and 10 respectively for the three trials. Since there is a continual improvement, it is difficult to sort out the elicitation effects of redoing the task from judging the demonstrations.

Errands

Subject E did 11, 12 and 11 of the thirteen possible errands in the three trials of the Errand Planning Task, slightly more than the average of 9.57, 11.83 and 10.14. In the first trial, he only inferred that he took the book to the library and rejected watching his favourite television show. In the second trial, he did all the errands but one, rejecting his television show. Also in the second trial, he did not verbalize his intent to miss the show. In the third trial, he omitted a reference to retiring. He was spontaneously referring to most of the errands before any eliciting procedures were begun.

Metacognition

Subject E's comments on questions which asked him to compare his first and last trial indicated that he was very aware of some of the points the Errand Planning Task attempted to convey. His actual response, however, was very disjointed. In describing the difference, he said:

> Yeah, 'cause some of the things about Drive In and Shopping Centre, I never thought, I didn't think about using them to pick the_____________ at the same thing - grocery store - record store - burger - cafe.

His response to the question asking him what makes a good plan showed that Subject E was very much aware of how the demonstrations on the Errand Planning Task were structured. He said, "Make up two different plans and take the better one." At this point, Subject E's ever present sense of humour shone through as he added, "Take your dog to school." He thought his own plan was very good because, as he said, "everything got done."

General Comments

Subject E listened quietly to the errand scenario as it was read. After the conclusion of the examiner's reading, he examined the map and the written version of the scenario for just short of two minutes. In his first verbalizations, he appeared to be planning: "Can't do that - (scratches head)." He then questioned aloud, "What time does the party start?" After receiving an answer to his question, Subject E began to plan but checked out other parameters such as, "Take the bus - ah - yeah - take the bus. I'd rather come to school on the bike - I can?" He then checked out the seriousness of the repair needed on the bike. He inserted some humour as he needed to pass his home to go to the dentist and said he would "take my dog to the dentist with me." When the examiner agreed, he said, "Just joking." As he planned his first trial daily errands, he referred to the sheet frequently. He then asked, "Can I check off which ones I've done?" and ticked off the errands he had accomplished. As he continued to work through the day, he continued systematic referrals to his paper as he worked, making a total of seventeen referrals to the written scenario as he worked. These referrals dropped to three on his second trial. In reaching his third trial he began working, accomplishing five errands before he elected to erase the checks from his previous work and check off the errands he had done on the third trial. His total number of referrals to the scenario for the final trial was eight.

The Self-Ordered Task--Subject E

The Self-Ordered Task consisted of organizing and carrying out a series of pointing responses. Each subject was required to touch pictures in a sequence according to a plan which he initiated and monitored. There was a high nonverbal visual memory component in the task.

Subject E took more time with the Self-Ordered Task than most of the other subjects who were part of the present study. His speed rankings were 5, 4, 5 and 5 respectively on sets 6 through 12. He took thirty-eight seconds longer to do set 12 than he had set 6 with increments of 12.67, 10.66 and 14.67 between sets (see Table 56).

Subject E made significant numbers of errors in all but set 6 (see Table 57). In set 8 his error score was higher than the mean error scores of the normal group and both frontal lobe patient groups. In the case of set 10, Subject E's error score equalled that of the mean error score of the right frontal group and was higher than the normals and those with left frontal lobe damage. On set 12 Subject E's error scores were higher than the mean error score of the normal group but lower than the right frontal lobe group mean error scores.

His total errors on all sets were in excess of the total mean score of the normals, essentially equal to the total mean errors of the left frontal lobe group, and more than the total mean errors of the right frontal lobe group.

The Questionnaire On Organizational Skills--Subject E

Procedure

Transcripts of responses to the Questionnaire on Organizational Skills were examined for general impressions. The tone or feeling conveyed was described, the emphasized topics were discussed, and example quotations were extracted.

Using the transcriptions and themes from the twenty questions which made up the Questionnaire on Organizational Skills, subjects' responses were grouped into six separate organizational skills: general organization, planning, inspection, regulation, verification and correct. The use of examples and spontaneous utterances was examined as well as the frequency of responses which were yes, no, or situation dependent. By quantifying these responses, subjects' performances across these organizational categories were examined and an attempt was made to see how subjects viewed themselves in terms of strengths and weaknesses as well as how those views compared to the descriptions of their teachers when those instructors answered the same questions.

Meaning units were also examined for preciseness. Descriptors were: word, comment and elaboration. Each of these descriptors were further categorized as general or precise. Statements were also examined to see if they reflected spontaneous replies or whether they were simply agreements/disagreements or parrotings of the examiner's words. In essence the majority of statements showed subjects' agreement or disagreement with a posed question. Thus, those so labelled were limited to words or comments which served no further purpose and gave the examiner no knowledge beyond if the behaviour was engaged in, not employed, or sometimes utilized.

General Tone

Subject E's responses flowed descriptively. Each question received a detailed reply which frequently reflected his feelings as well as his actions. Subject E's transcripts appear verbatim in Appendix Q. The freedom Subject E felt in sharing the emotional strain of living daily with a severe reading problem is illustrated in the following quotation:

> I hate the starting of school, because - you know - when you start school, you don't know them - they don't know you, and unless they know you, if there's some reading that they're doing out loud, it never fails that I always get asked and I hate it! Ah - I just get cold chills up my back - I just hate it 'cause I feel such a dummy and I think about all those other guys thinkin', "What's this guy doin'?" This year especially, because I've been taking Grade 10 courses and I'm in Grade 12. I just don't feel good. I didn't like it.

It was obvious that Subject E had developed coping mechanisms but it appeared that he had to reestablish himself on a yearly basis, often abandoning useful strategies as he encountered new situations. When asked if he had ever had a classroom buddy to assist him, he replied: "They've done it. That's happened before." It was clear that if he could not cope and had not talked his problem over with the teacher he had also developed avoidance mechanisms. He reported that he might just sit in the class or might not hand in an assignment. When asked if he handed in a polished product, he replied:

> Sometimes, if I don't have to hand it in like that class if I can have a day or two to work on it, it's usually polished. But if it's to be done in class, then usually most of the times I don't get it in because it won't be finished and he can't - the teacher wouldn't be able to read it anyway.

He was aware that he could not manage on his own:

Examiner: Do you proofread your written assignments?

Subject E: No, I don't. I usually get my Mom to.

But he did not always find requesting help to be a palatable effort.

Subject E: It's just - I don't feel good asking. I don't feel like going - going out of my way. My mom's told me it's stupid and Mrs. _______ has told me it's stupid - you know but I don't feel good going up to a teacher that I don't know before, and saying, "Hey, look it. I can't read very good. I got a reading problem." Like I'm asking if - to me it feels like I'm asking for special privileges.

Examiner: Mhm. Would it be easier for you if someone else did that for you - like Mrs. _______ or someone?

Subject E: It's easier that way. Then I don't think - but - then I don't feel like I'm doing it.

Subject E's transcripts yielded the following impressions:

1. That he was very aware of the discrepancy between the academic demands of the classroom and his own skill levels.
2. That he had no feeling of continuity of support from year to year even though the extent of his problem had been well documented in early primary school.
3. That he had good knowlege of the necessary interactions he needed to employ for his day-to-day survival. As well, he had knowledge of his coping mechanisms. He seemed to be less aware of how to implement more precise techniques to improve his academic standing.

Self-Perception of Organizational Skills

In looking at Subject E's performance across six organizational skill areas, response patterns emerged. He spontaneously elaborated on most of his responses without the necessity of further probes. Seventeen of his twenty responses were accompanied by example and twelve of those spontaneously followed the examiner's first question (see Table 88). He saw his involvement in the use of the skill areas outlined by the Questionnaire largely as situation dependent. Thirteen of his responses reflected that he used the strategies sometimes but not always--depending on the situation. He gave only four strictly affirmative and three straightforwardly negative responses to questions. Two of his positive answers were to questions regarding his Correction skills: he reported that he corrects errors he notices and does not wait to be told by others to correct them and that he always rewrites an original draft. In the latter case, however, he added that he rewrote because of the red ink on his paper. This would indicate that he may not have understood the former question. He also said that he always set priorities when he had a series of things to do and that he integrates earlier parts of his work by checking back as he works.

His three "no" responses were in answer to inquiries in three separate skill areas. Subject E said he did not inspect his work as he went along, that he did not work out alternate solutions to problems, and that he did not proofread assignments.

By quantifying his responses as described in Steps Twelve through Fourteen of the procedure for analyzing the Questionnaire On Organizational Skills found in Chapter V of the present study, it was possible to ascertain Subject E's relative ratings of himself on the six organizational skills being examined. Through this step, it was seen that Subject E rated himself lowest in the area of Verification skills and most highly on Correction skills.

Comparisons of Self-Perceptions with Teacher Perceptions

Subject E's quantified scores and relative rankings were then compared to how he had been rated by his Facts of Life and English teachers. Subject E and his Facts of Life teacher had identical areas ranked highest and lowest: Correction and Verification respectively. The English teacher's rankings bore no similarity to Subject E's opinions. In the academic setting, his General

Organization skills were ranked most highly and his Regulation skills were seen as the weakest area.

Subject E described himself as organized but quickly added "sometimes disorganized - I've been told." When asked to elaborate on whether he would be referred to as disorganized, he replied: "I don't know. School work and that."

In her comments about Subject E, his Facts of Life teacher showed some understanding of his problem by writing: "__________'s written assignments are very difficult to understand if he does not get additional help with the spelling." Subject E's English teacher added the qualifier "in my class" after labelling him as disorganized. She also commented, "He does much better elsewhere, I gather."

Preciseness of Verbalizations

In examining each meaning unit for preciseness, it was found that Subject E's verbalizations were primarily in the category of General Comments (see Table 93). It should be noted as well, however, that Subject E made more precise comments than any other subject in the present study and just one less precise elaboration than the highest number in that category. Subject E had very few responses which were individual words, the lowest number in the present study.

Eighty-nine percent of Subject E's statements were his own. That is, they were not composed of simple agreements/disagreements or parrotings of the examiner's words.

The Interview Regarding Study Habits--Subject E

Themes from Questions 3, 4, 6, 7 and 9 from the Interview found in Appendix J were examined and labelled as to whether they reflected the subjects' knowledge of their study and work habits or demonstrated their awareness of their ability to regulate those habits. Criteria for assignment of "knowledge of" or "regulatory" labels were adapted from Brown and Palinscar's 1982 discussion of metacognition and may be found in Table 95. In an example, a verbalization identifying a research technique such as "looking it up in books" is a knowledge statement regarding study habits, while a subject saying that he "started [researching] early because I found I needed all the time I could get" shows a regulatory component.

Notation was also made when the subjects did not seem to know how they could intervene to change an ineffective habit. "Knowledge of" labels were further defined as general or specific. As well, total theme and spontaneous theme patterns were established by ranking the number of statements falling into the two "knowledge of" and the regulatory categories.

The stipulated sections of Subject E's transcripts were divided into twenty-seven themes. None of his statements reflected an inability to regulate actions or a lack of knowledge. Only two of his statements were labelled as being more reflective of the examiner's ideas than his own.

In analyzing the themes and underlying transcripts of Subject E's responses in the Interview Regarding Study Habits, a pattern emerged (see Table 103). Subject E's themes were almost entirely labelled "knowledge of." Only three of his twenty-seven themes reflected "regulatory" components. The "knowledge of" statements themselves were almost equally distributed between specific and general descriptors. Both when considering all statements within the "knowledge of" category, and when only evaluating spontaneous expressions, general themes exceeded specific themes by two.

In summary, Subject E's verbalizations were almost entirely "knowledge of" statements in which specific and general subcategories were almost equally represented. The total theme and spontaneous theme patterns were constant.

The examiner felt that Subject E was very open in his interaction with her. He talked at length about his learning disability, its effects on his schooling, and his feeling about facing academic demands on a daily basis. What was most striking about Subject E's words was the strong emotional component, encompassing both pain and fear, which could be engendered by what to most students were quite ordinary or even boring events. Some of his verbalizations which reflected this intensity of feeling were:

> Subject E: [On hard subjects]: Spelling - I hate Spelling. I hated this Spelling test so - with so much passion 'cause I always ended up writing the whole test almost 20 times or whatever we had to do.
>
> [On preparing for exams]: Last couple of years? I wouldn't do nothing, hardly do anything. Because I usually get so nervous, so flustered trying to review everything that the last two years I haven't done anything . .
>
> [On writing]: Writing is - I don't know - to get the spelling down right. I

> think too much about it - have to concentrate. That's why it's hard for me to take notes. I can not - this year I haven't taken very many notes because I'm still concentrating, I've missed all what he's said. I'm usually so far behind so I just sat back and listened and I got a friend's notes.

Interspersed with the frustration, Subject E often outlined his coping strategies or his survival techniques. He appeared to be very aware of his shortcomings and often, as in the last example above, knew why he could not meet the expected requirements. He usually had developed some manner of seeing a difficult situation through, either by avoidance or adaption. He knew the value of employing others in assisting him when the demands were above his skill level. The example of utilizing a friend's notes has already been mentioned. The following example illustrates how his mother helped him and also exemplifies the sense of humour which often surfaced during the data collection.

Examiner: What do you do when you're left pretty well on your own to do an assignment, like writing as essay? Can you describe to me what you would do?

Subject E: Panic! (laugh) I usually - I haven't worked on an essay for so long. I usually get help - my Mum would help me - she'd help me out. We'd go find books and then find the topic in the books and then write down the information. Then go from that and write it out in words and so - her words, too. She'd help me that way. I usually tried to start it early 'cause I needed all the time I could get on it. Still, I'd come right down to the wire to hand it in.

Subject E had clear career goals which involved postsecondary training. His responses show a perceptive knowledge of the gap between his skills levels and the past and current demands of school and a determination to succeed despite the odds.

CASE STUDY BASED ON DATA COLLECTED FROM SUBJECT F

The Academic And Processing Skills Assessment - Subject F

Subject F was 18 years 10 months old when he participated in the present study. He was in Grade 11 and carrying four subjects in his second term, three of which were graded and were academic in nature. His fourth class was resource room. Subject F's average was 72.3 percent. His highest grade was 77 percent in General Math and his lowest grade was a 65 percent in Biology. His final average at the end of his first term had been 56.8. Although he had received two 50 percents in the first term, he had failed no subjects that academic year.

Subject F presented as a study in contrasts. A young man with some native ancestry, he lived in poverty. He was included in the present study as a designated learning disabled adolescent whose cultural background may have affected his learning adversely.

Subject F was first referred for clinical assessment and tutoring in the first grade and had a subsequent history of school problems. Although he could claim Indian blood by one grandmother, he felt keenly the plight of the native people, as is evidenced by his own poem:

I think about what people
  taught me
but there is no comfort there.
All I think about is how
  my people suffered,
This was our country
  untill [sic] they came.
They made us live in special
  placing
and they stole away our pride.
It can never be the same,
  how I hate them.
It was a good life, now its gone.
I am a red man, I was proud,
  I was strong,
who [sic] are a white man, and
  you stole away my home.
You people bring me down
Makes me wish that I was
  dead
Now I am a wooden Indian
  standing sieltly [sic] in the rain.
  Swear by my Grandfather father
We are going to rise again.

A most interesting young man, Subject F was a lover of J.R.R. Tolkien. He read and reread the Tolkien books and could recite the episodic developments as though he were relating the history of his own nation. In contrast, his scores on a standardized reading test were not high. His percentile scores on the Word Identification and Word Attack subtests of the *Woodcock* were 9 and 7 respectively. Interestingly, his score on the Passage Comprehension subtest was considerably higher, falling at the 38th percentile.

Subject F's errors in Word Recognition revealed that he seemed to examine initial and medial portions of a word but guess before the final portions were considered: (*radioactive* for *radioactivity*, *skeleton* for *skeletal*, and *physical* for *physicians*). Some difficulty in retaining the visual image of a word pattern was noted. For example, he made errors when doing far point copying from a model, circled the wrong word when requested to recognize a word among distractors, and did not always revisualize words accurately when they were presented auditorially. However, errors in these tasks as presented by the Malcomesius were minimal.

Subject F's auditory memory was not strong. He obtained a scaled score of 6 on the Digit Span subtest for the WAIS-R. His memory for meaningful sentences was superior to his memory for unrelated words, with subtest scores on the Detroit of 12 years and 3 months and 8 years and 6 months respectively. He also found it very difficult to analyze words auditorially to determine the number of syllables present, as measured on the Syllablication subtest of the Fullerton. His score was more than one standard deviation below the mean on that subtest.

Subject F's scores on other formal language measures were variant. He scored markedly below criterion on the Processing Relationships and Ambiguities subtest of the CELF. Error patterns seemed to indicate particular difficulty in categories dealing with analogous and familial relationships. His age score on the Verbal Absurdities subtest of the Detroit was 14 years 0 months. His score on the Grammatic Competency subtest of the Fullerton, which requires him to recognize correct and incorrect usage, was one standard deviation below the mean, but his score on the Producing Formulated Sentences on the CELF was above criteria. His performance on the Divergent Production subtest of the Fullerton was below the mean.

Subject F's percentile score on the WRAT (untimed) was 66. His scaled score on the Arithmetic subtest of the WAIS-R was 6.

Subject F was rated disorganized on the questionnaire by both his English and resource room teachers. His English teacher gave him a score of 40. On four occasions in filling out the questionnaire she noted that Subject F could not see errors unless they were specifically pointed out. These notations were on items 11, 15, 16 and 17 of the questionnaire and related to verification (11 & 17), inspection (15) and regulation (16) questions.

Subject F's resource teacher also gave him a rating of 40 on the questionnaire amd in her remarks commented on his poverty and isolation. She noted that he tended to give up easily in Math and that he did not proofread his written assignments.

The Rods Task--Subject F

Sequentially, the subtask sequence of the Rods Task moved from Free Performance 1, or Trial 1; to Pairs Choice; to Free Performance 2, or Trial 2; to Final Choice; and then to Independent Test. Following the task, metacognitive questions were asked. Before the experiment began and after it was concluded, subjects were asked to name all the things they thought "mattered for bending."

Free Performance One

Subject F was unable to use the control-of-variables strategy in the first Free Performance Trial. He made six tests and mentioned five of the expected variables. He tested one variable using an unconfounded test: base.

He approached the task in a superficial manner. His focus was more on discerning the examiner's opinion of his actions than it was concentrating on the task. After his second test he asked, "How long do you want me to keep doing this?" His voice was very soft, necessitating requests for him to repeat his statements and making the audio recording difficult to transcribe.

His verbalizations indicated that he was investigating a specific variable in his test. For example, length: "Well, the longer they are - then more bendable - like if they were short - they barely bend at all . . ." or "Steel resists bending - and plastic bends easier."

Pairs Choice

Subject F was able to accurately judge the better or unconfounded test in three of the five tests presented to him. His explanations were succinct. In discussing why he chose 20-4-P and 20-3-P over 20-3-S and 20-3-P_W as the best of thickness, he said simply that he had chosen the rod pair because "they're made out of the same thing" (examiner commented by saying O.K.) "and one's thicker than the other." He tended to describe the pair he chose rather than comparing and contrasting the two pair.

Free Performance Two

Subject F did not use the control-of-variables strategy in the second Free Performance Trial. He made unconfounded tests of three variables: base, diameter and length. He seemed to "pick up" the descriptive idea from the previous Free Choice elicitation, describing five of the six variables in his first test. However, the test was confounded. Nonetheless, his three unconfounded tests would have classified him as a student from whom the control-of-variables strategy had been elicited if the Stone criteria had been employed.

In testing, he made reference to all six variables, making him one of two subjects who did so. His explanations were expanded from Trial One in terms of the number of variables he referred to.

Final Choice

Subject F made two errors in the Final Choice phase. He was required to answer yes or no to six questions which asked him to judge whether an examiner-displayed set of rods was a good test of a specified variable. His explanations were targeted on the similarities and differences of the variables.

Independent Test

When asked to construct a test of his own to show one thing which mattered for bending, Subject F was able to do so. His example was an unconfounded test of bases.

Metacognition

Prior to the first Free Performance Trial, Subject F named one possible variable which might make a difference in bending: length. Following the Independent Test, he listed five variables. Four of these dimensions were those which had been part of the discussions surrounding the experiment. The fifth was "capability of the resistance."

When asked if he had changed his mind from his initial position, he replied, "No." In responding to the question querying if he had learned anything from doing the experiment, he said he had learned "a little."

Examiner: What?

Subject F: That different materials - they're different - even though they're made out of the substance - that things will be different.

Examiner: Tell me a little bit more about that - I don't quite understand -

Subject F: Well - plastic - one could be thinner - and be different or you could have one that's steel and one that's plastic - the plastic one could be smaller but the steel will resist just as much.

Examiner: So, could you kind of summarize what you've learned then? - about these two things you've just mentioned.

Subject F: Ah, the plastic measures - and - all the things made - and resistance it has - what's the capability of the resistance.

Examiner: O.K.

The Text Search Task--Subject F

The Text Search Task was divided into three parts. The first part consisted of an introduction of the materials, a demonstration of the principal features of the text (without describing their use), and an open-ended instruction to find the answer to a specific question. The second part was an elicitation phase which consisted of a three-part demonstration of text search strategies of varying efficiencies from which subjects were to select the best approach. The third part of the session was another open-ended question which permitted subjects to demonstrate any changes in strategy use.

Trial One

Subject F utilized a modified type 3 strategy spontaneously, modified meaning he utilized the index but not the table of contents. He turned immediately to the index, finding the appropriate key word and page number. He located the page and the specific paragraph without difficulty.

Demonstrations

When asked to select from the demonstrated approaches of locating the answers to two other questions, Subject F chose the type 3 strategy for both demonstrations. His explanation for the first demonstration was spontaneous, while in the second instance the examiner had to extend a number of probes to help him to see another reason for choosing the index.

Demo 1

Examiner: Those are my three methods, which do you think is best?

Subject F: Mmm, the third one.

Examiner: Why?

Subject F: Because - you're - the first one you only look through the book tryin' to find a picture - and they may not have a picture . .

Examiner: Right.

Subject F: The second one, you just look up the main heading - while the third one you look up the main heading and you turn to that page and then you look up to the back and you'd probably find it a lot easier.

Examiner: O.K., so you think it would be easier and anything else - why it's better?

Subject F: Quicker.

Demo 2

Examiner: So, which was the best of the three?

Subject F: Third.

Examiner: And your reasons, again?

Subject F: It's quicker . .

Examiner: K.

Subject F: It's easier - and the other two take too long - have to flip through pages.

Examiner: Also, is there anything else? What did I find as well by looking back there this time?

Subject F: Mmm, I don't know.

Examiner: I looked up plants.

Subject F: Mmm [reads from index].

Examiner: O.K. and I found page 70 to 72, so what does that tell me?

Subject F: That it's - ah - more than one page . .

Trial Two

Subject F again used a type 3 strategy, as he had in the first trial. That initial usage had classified him as a spontaneous user of the preferred strategy. He verbalized, with encouragement, the steps he followed. He called the front of the book the back of the book here and in his summarative comments but self-corrected his errors. He called the table of contents the glossary; however, the important factor is that he used the table of contents along with the index, indicating that that portion of the demonstration was observed and elicited.

Metacognition

In comparing his performance on the two trials and outlining the differences that he perceived, Subject F did not describe the difference in his approaches. Although he used a type 3 strategy on Trial One, it was modified in that he went directly to the index. On Trial Two he used the table of contents prior to using the index. The examiner gave him a second probe and opportunity to recognize the difference, but he did not do so. Interestingly, however, when asked what he had learned from doing the Text Search Task, Subject F replied, "That you should use the index and you should try to find the chapter it's on before you go to the index." While the last part of this statement does outline the change in his behaviour, the first statement, "That you should use the index . . .", does not reflect a knowledge of what he had learned, given the fact that he used the index spontaneously when first presented with the task. However, he did recognize that he had learned a value of the table of contents.

He believed that using the index was the best method.

Examiner: Why do you think that's the best mehtod?

Subject F: 'Cause they tell it out very plain and you don't have to go looking for something you don't need.

Examiner: O.K. You said they tell it out very plain - can you tell me a bit more? What do you mean by that?

Subject F: Mmm, like, if you're looking for a special phrase or something like that - they'll most likely tell you about it - in some books, that is.

Examiner: O.K.

Subject F: And they'll just tell you exactly what page it's on.

Examiner: O.K. So, what's the basic advantage of using the index, then?

Subject F: Simpler.

Examiner: Mhm.

Subject F: And you find it a lot quicker.

In summary, Subject F did separate all that he already knew from that he had just learned. While he accurately reported that he learned the value of the table of contents, he also said he had learned to use the index through the Text Search Task. In reality, he had used the index spontaneously before the elicitation, so he did not learn it through the task. Subject F regulated his actions according to his knowledge, incorporating new knowledge which came to him during the demonstrations.

The Errand Planning Task--Subject F

In the Errand Planning Task, the subject was essentially required to organize a list of errands. He was to decide which errands he would do, the times at which he would do them, and how he would get around from errand to errand. Sequentially, the subtest sequence was a Free Performance step in which he was given two opportunities, Trial 1 and Trial 2, to plan and verbalize his strategy; a series of three pairs of scenarios which he had to judge as to their relative efficiency; and another Free Performance Trial, or Trial 3. Following the task, metacognitive questions were asked. Trials were compared by examining student references to movement, time and errands, and for that reason the discussions will be in terms of those three elements rather than a sequential description of performance of the task elements.

Movement

Subject F's references to movement in general and to specific kinds of movement in particular both followed the same pattern. There were a number of referrals in the initial trial which increased in Trial 2 and then decreased quite considerably for Trial 3. The pattern indicates that Subject F spontaneously used specific place referents but increased his usage even more following an opportunity to "redo" his initial plan. Judging demonstrations did not seem to increase further either his use of general or specific movement references. Indeed, both usages dropped quite markedly, from 25 to 12 for total references and 15 to 7 for specific references.

Subject F's references to specific types of movement showed changing patterns. In Trial 1, he walked the most, then used the bus, then his bike. In Trial 2, each mode of transportation was used equally. In Trial 3, he used the bus the most, followed by walking. He did not ride his bike in the final trial.

The average number of references made by subjects of the present study were 16.71, 15 and 12.57 respectively for the three trials. Subject F made 17, 14 and 12 references in relation to his movement while outlining his plans for accomplishing the errands.

Demonstrations

Subject F chose the preferred sequence on all three of the paired demonstrations. His explanations for his choices respectively in each of the three demonstrations were essentially: "You do more things."; "You're saving time."; and "Didn't do as much." In each of his explanations he tended to list events and errands in the form of proof of all the things which were done or as examples of what was omitted and in his opinion should have been included. In referring to Trial 1, he did not mention the long unproductive wait at the dentist's office but did notice that in the preferred sequence " . . . you're doing most stuff and you have more time." By the second demonstration he had begun to equate saving time with taking the bus, which may account for the shift in pattern in his choice of movement from walking as a priority to using the bus.

Examiner:	Which is better?
Subject F:	The first one.
Examiner:	Why?
Subject F:	Because when you go to these places - you're saving time.
Examiner:	O.K.
Subject F:	And you're also taking the bus - and this guy, he's walking here and he's walking there and he's not having much time - he may study but he's not even with his time, even if he took his bike - he'd save about an hour.

Time

Subject F's time references varied little from trial to trial. He made the most references on his second trial, with his third trial dropping again to a level midway between the first and second trials. In Trials 1 and 3, his time references exceeded his errand references by one, while on Trial 2 he made two more time references than errand references. In short, he was giving a time reference on an average of once every errand reference. With Subject F, spontaneous time reference appeared to occur with a slight increase when redoing his initial trial.

Errands

Subject F did 8, 13 and 8 of the thirteen possible errands in the three trials of the Errand Planning Task. These figures were below the mean tabulations of 9.57 and 10.14 for Trials 1 and 3. However, he did more than the average of 11.83 errands on his second trial by completing all the errands. He was the only subject in the present study to do all the possible errands in a single trial. The discrepancy of five errands between his first and second and second and third trials was also unique. No other subject had variations of greater than two among the errand references on the three trials of the errand task.

On the first trial, he made two inferences: taking the baking to his grandparents and buying a record. He also omitted three tasks: fixing his bike, getting ready for the party, and going to bed. On the third trial, he inferred that he took his book to the library and omitted four errands: one that he had omitted on Trial 1 and three which he had included or inferred in Trials 1 and 3. The omissions included: getting ready for the party, going to the dentist, taking baking to his grandparents, and meeting a friend for a hamburger.

Redoing the planning seemed to be very useful to Subject F when looking only at Trials 1 and 2. His poorer performance on Trial 3 may indicate that he was not influenced by the demonstrations.

Metacognition

Subject F described the factors which make a good plan as "the time spent on it, doing most of the things, and going where you're most needed." A poor plan, on the other hand, was "not doing the things they have to do - ah, wasting your time on things that don't matter - and, um, goofing around."

Subject F revealed something of his approach to life in comparing his first and third trials. Electing his last trial as his best, he described why it was best by saying, "You got to do everything almost." He went on to say:

> Except for the parents - which they could probably wait until tomorrow - and the dentist you could probably make a different appointment - tell him you forgot or something - and he'll probably understand - while if you miss the party - oh, well - your friend won't like you.

The examiner probed at this point by saying, "But you had only one thing that you could not miss in all of that and that was your dental appointment - remember - that was the one thing you couldn't miss - anything else you could play around with." The discussion continued:

> Subject F: Oh - too late now - I don't like the dentist anyways.
>
> Examiner: O.K. Why do you think your last plan was best then?
>
> Subject F: Because I did the things I wanted to do and not the things that people told me to do . .
>
> Examiner: O.K.

Subject F: And it wasn't necessary for the dentist 'cause I don't like dentists anyway.

The examiner made no attempt to counter Subject F's statements, simply agreeing and allowing elaboration, or passing to the next item if Subject F seemed finished with his thought. On his own he made an interesting about face.

Examiner: Did you learn anything about planning today?

Subject F: A little.

Examiner: Can you tell me what?

Subject F: Some things don't matter as much and you should even out your time a little better, like - spend so much time for that and this and make sure you got a plan - like - just don't go wherever you want - like, if you have to be somewhere - even out your time so you can be there by that time.

Examiner: What do you think about the planning you did today? Do you think you made a good plan?

Subject F: For myself - yeah - but I shoulda' went to the dentist - and I shoulda' told my grandparents I wouldn't show - everything else worked out O.K . .

In Subject F's opinion, he omitted one task in the first scenario. He said that he only studied an hour and therefore, as he said, "I didn't study - except for an hour." In the first trial he was aware of only two of the four omissions he made. In his opinion, in his second trial, which he was not asked to compare, he "didn't have enough time to do things." In truth he did all the errands on that trial. His perception of his own inefficiency was not supported by the reality of his performance.

General Comments

Subject F inserted "jokes" and comments as the examiner described the materials and read the scenario. When told he was to do a group of errands, he queried, "What if I don't have a car?" As the examiner outlined the forms of transportation, he added, "Hire a cab." As he passed the record store he said, "Break and enter." He zeroed in on the studying by saying, "Yeah, but not many people spent time studying, right?" As soon as the examiner was finished reading the scenario, he said, "O.K. Good. Do I have to study for two hours, too?" When the examiner said that was up to him, he said, "But I have to study for two hours, right?" Further assurances that he could choose the errands did not seem to dissuade him as the first task he reported doing was to study.

The Self-Ordered Task--Subject F

The Self-Ordered Task consisted of organizing and carrying out a series of pointing responses. Each subject was required to touch pictures in a sequence according to a plan which he initiated and monitored. There was a high nonverbal visual memory component in the task.

Subject F worked very quickly through the Self-Ordered Task. Indeed, he ranked first in all four sets in terms of speed of completion. There was an increase of only 14.67 seconds between the time taken to complete set 6 and the time taken to do set 12. His time per set showed slight increases of 5.67 seconds between sets 6 and 8, 3.5 seconds between sets 8 and 10, and 5.5 seconds between sets 10 and 12.

Subject F made significant numbers of errors in all sets of the Self-Ordered Task (see Table 57). Indeed, his total error score was the highest of all subjects tested in the present study. In all sets his errors exceeded the mean error scores of all three comparison groups: the normals as well as the left and right frontal lobe patients. His total number of errors also exceeded the total of the mean error scores for each normative group.

In addition to touching one position on successive pages until reminded to stop, Subject F frequently touched the same picture on two pages following without any apparent recognition that he had done so. He made a total of seven such errors on the twelve trials.

The Questionnaire on Organizational Skills--Subject F

Procedure

Transcripts of responses to the Questionnaire on Organizational Skills were examined for general impressions. The tone or feeling conveyed was described, the emphasized topics were discussed, and example quotations were extracted.

Using the transcriptions and themes from the twenty questions which made up the Questionnaire on Organizational Skills, subjects' responses were grouped into six separate organizational skills: general organization, planning, inspection, regulation, verification and correction. The use of examples and spontaneous utterances was examined, as well as the frequency of responses which were yes, no, or situation dependent. By quantifying these responses, subjects' performances across these organizational categories were examined and an attempt was made to see how subjects viewed themselves in terms of strengths and weaknesses, as well as how those views compared to the descriptions of their teachers when those instructors answered the same questions.

Meaning units were also examined for preciseness. Descriptors were: word, comment and elaboration. Each of these descriptors was further categorized as general or precise. Statements were also examined to see if they reflected spontaneous replies or whether they were simply agreement/disagreement or parrotings of the examiner's words. In essence the majority of statements showed subjects' agreement or disagreement with a posed question. Thus, those so labelled were limited to words or comments which served no further purpose and gave the examiner no knowledge beyond if the behaviour was engaged in, not employed, or sometimes utilized.

General Tone

Subject F's responses were primarily composed of one-word and short comment responses. He seemed rather detached from the questioning and gave very little description of his task approach. Several probes were sometimes given to draw out more information but they were not usually successful.

Examiner: Do you have a plan for an assignment when you start it?

Subject F: No, I don't.

Examiner: You don't usually set out a plan?

Subject F: No.

Examiner: How about when you're writing an essay?

Subject F: No.

Examiner: So you just begin to write?

Subject F: Yep.

On occasion, the examiner was able to elicit some information from him but it generally lacked detail.

Examiner: Do you ever edit or rewrite an original piece of work - say you're writing a poem or a paragraph, do you ever edit or rewrite it?

Subject F: Yes.

Examiner: Do you usually do that?

Subject F: No, just sometimes.

Examiner: What would you tend to do that with,________?

Subject F: A story. If I think it's sloppy, I'll rewrite it.

At the same time, however, Subject F did reveal some of his fears and coping mechanisms.

Examiner: Do you compare the results of your work with what the teacher asked you to do in the first place?

Subject F: No.

Examiner: Why not?

Subject F: I don't want to know if I got it wrong.

Examiner: You don't want to know if you did get it wrong - is that what you said? You'd rather not know?

Subject F: Yeah.

Examiner: K.

Subject F: Sometimes I don't look at the test marks,
I'd rather not see what I got.

This expressed avoidance was later substantiated in action. Subject F was the only subject in the present study to request that he not be told the results of the standardized testing done as part of the data collection.

Subject F's transcripts yielded the following impressions:

1. That he wanted to give the impression of being uninvolved with his school experience, maintaining his individualized approach rather than that expected by the teachers.
2. That he shared little knowledge of how he learned or interacted in his classroom setting.
3. That he had an interest in school which had stimulated him to return to classes despite his age and the adverse circumstances in which he lived but he did not reveal that interest in this particular conversation.

Self-Perception of Organizational Skills

In looking at Subject F's performance across six organizational skill areas, response patterns emerged. He provided little elaboration and primarily agreed or disagreed with the examiner. Only ten of his eighteen responses were accompanied by example, and only one of those examples spontaneously followed the examiner's first question (see Table 88). He responded "no" most frequently, with situation dependent responses coming next. He made only four firmly affirmative statements. He reported that he felt he knew what to do after the teacher gave instructions for an assignment; he usually had materials needed for an assignment on hand; he set priorities when he had to finish a series of assignments; and he usually carried through to the end of an assignment.

By quantifying his responses as described in Steps Twelve through Fourteen of the procedure for analyzing the Questionnaire On Organizational Skills found in Chapter V of the present study, it was possible to ascertain at least in part Subject F's relative ratings of himself on the six organizational skills. However, because one of Subject F's responses was unintelligible and he was not given the opportunity to answer another question, the lower rankings are somewhat suspect. Quantification of scores indicated that Subject F rated himself most highly in General Organization and had his lowest ranking in Inspection. Correction skills and Verification skills shared the second lowest ranking. It must be stressed, however, that, as mentioned, the numerical ratings for both Inspection and Correction were artificially depressed.

Comparison of Self-Perceptions with Teacher Perceptions

Subject F's quantified scores and relative rankings were then compared to how he had been rated by his Resource Room and English teachers. Subject F had ranked himself most highly in General Organization, and that opinion was shared by both his teachers. His Resource teacher rated him lowest in Inspection and Verification, which also had been identified as weak areas by the subject himself. Subject F's English teacher ranked his Correction skills as the lowest, which once again was one of the lowest rankings by Subject F himself.

Subject F described himself as disorganized, a view shared by both his teachers, who also gave him identical total numerical ratings. Subject F's Resource Room teacher wrote:

> I had ________ at a time when he was experiencing much difficulty in his personal life - an older student, no friends, he failed subjects the previous semester, impoverished family, and without direction as to future employment. Disorganization was most evident in the planning of written work, math problems and proofreading. He'd simply give up on hard Math work. He never proofread written work despite all manner of mechanical and usage errors.

His English teacher commented that "he usually cannot see any errors without having them specifically pinpointed." She also wrote:

> Although he is organized with his equipment, supplies and arrival times, he had difficulty organizing his written work and his plan of attack for doing it. Perceptual problems seem to be a major factor in his lack of organized attack on written work.

Preciseness of Verbalizations

In examining each meaning unit for preciseness, it was found that Subject F's verbalizations were primarily in the category of single general word responses (see Table 93). His number of general and precise comments were almost equal. Only one of Subject F's statements was labelled as an elaboration; a precise elaboration. In that respect, he and Subject A, who used only one general elabortation, were unlike other subjects in the present study, all of whom included elaborations as part of their verbalizations.

Only forty-nine percent of Subject F's verbalizations were his own. The remainder were composed of simple agreements and disagreements of the examiner's words.

The Interview Regarding Study Habits--Subject F

Themes from Questions 3, 4, 6, 7 and 9 from the Interview found in Appendix J were examined and labelled as to whether they reflected the subjects' knowledge of their study and work habits or demonstrated their awareness of their ability to regulate those habits. Criteria for assignment of "knowledge of" or "regulatory" labels were adapted from Brown and Palinscar's 1982 discussion of metacognition and may be found in Table 95. In example, a verbalization indentifying a research technique such as "looking it up in books" is a knowledge statement regarding study habits, while a subject saying that he "started [researching] early because I found I needed all the time I could get" shows a regulatory component.

Notation was also made when the subjects did not seem to know how they could intervene to change an ineffective habit. "Knowledge of" labels were further defined as general or specific. As well, total theme and spontaneous theme patterns were established by ranking the number of statements falling into the two "knowledge of' and the "regulatory" categories.

The stipulated sections of Subject F's transcript were divided into thirty-one themes. Two of his statements reflected a lack of knowledge. He would offer no suggestions as to why he had experienced school problems; he simply said he did not know why. He also denied having a reading problem as a young child. As many as eight of his statements were labelled as being more reflective of the examiner's ideas than his own.

In analyzing the themes and underlying transcripts of Subject F's responses in the Interview Regarding Study Habits, a pattern emerged (see Table 103). Subject F's themes were almost entirely labelled "knowledge of." Only three of his thirty-one themes reflected "regulatory" components. The "knowledge of" statements themselves were equally distributed between specific and general descriptors. Both when viewing all statements within the "knowledge of" category and when only evaluating spontaneous expressions, general and specific themes were identical in number.

In summary, Subject F's verbalizations were almost entirely "knowledge of" statements in which specific and general subcategories were equally represented. The total theme and spontaneous theme patterns were constant.

The examiner felt that Subject F did not always enter fully into the interview. He had exhibited some inappropriate social behaviours and, when these were identified obliquely and boundaries placed on his actions, he withdrew into a pattern which came close to sulking. He was rather offhand and superficial initially but did share some of his perceptions openly.

The major point which Subject F brought up repeatedly and with apparent sincerity was his inability to concentrate and study. He began what would be a repeated theme when he was discussing the qualities which made some students successful. The focus of his words moved from others to himself as he spoke.

Examiner:	Why do some people do very well in school?
Subject F:	Why?
Examiner:	Mhm.
Subject F:	Mmm, they try harder, I guess. They're just lucky (a tinge of bitterness in his voice) to be born that way.
Examiner:	Born that way?
Subject F:	High IQ and stuff like that - while others simply don't care - others have problems.
Examiner:	Like what?
Subject F:	Can't study - You try - keep trying - but each time you pick up a book, you just can't.

When asked how he would prepare for an exam, he described his problems in more detail. The following excerpts outline some of those frustrations.

> I'd take - I'd take home the book and I'd - When I'm not that busy I'd open it but my mind would wander and I wouldn't study for that.
>
> Yeah, I'd study if I could but every time I - even when I'm alone - I can't study - even if no one's there -
>
> Yeah, well, notebook and then I'd open to the part - I'd start reading and then my mind would start to go blank and I'd look around to see what there is else to do - try to do something else . .

When Subject F mentioned that he became distracted easily by the T.V., the examiner tried to pursue how much environmental factors played in his problems.

> Examiner: Do you have a quiet spot where you go ever to study?
>
> Subject F: Mhm - my room - but then I got things in there - and then I start thinking about the things in the room.

He repeated later, in the discussion of subject interest, "I can't study."

Subject F appeared to have little knowledge of his skills, the demands of school, or how he might go about improving his academic performance. He seemed on the outside of the process and powerless to effect change.

CASE STUDY BASED ON DATA COLLECTED FROM SUBJECT G

The Academic And Skills Processing Assessment--Subject G

Subject G was 15 years 11 months when he participated in the present study. He was in Grade 10 and had taken six subjects during the school year, five of which were academic. His then current average was 47 percent with only two passing grades evidenced: Physical Education at 70 percent and English at 56 percent. His lowest grade was 28 percent and was obtained in Science. He was failing Math.

Subject G was selected as a student whose problems in Mathematics exceeded his difficulties in Reading. His Arithmetic scaled score on the WISC-R was 7 and his percentile score on the Arithmetic subtest of the WRAT was 21. Interestingly, he achieved no increase in his score in an untimed extension on this latter measure.

Subject G's reading skills were divergent. He had obtained a percentile score of 75 on the Reading subtest of the WRAT during a screening process designed to locate a subject with good Reading but poor Math skills. On the Woodcock his Word Identification score reached the 64th percentile and his Word Attack score was at the 85th percentile. Despite these scores, he obtained a percentile score of only 38 on the Passage Comprehension subtest. Subject G disliked reading intensely and avoided it at all cost.

His errors on the Word Recognition subtest of the Woodcock were primarily problems in pronunciation. For example, expostulate as expoestulate, aria as area and beatitude as beetitude. Subject G experienced only minor difficulty retaining visual patterns in recognition and reproduction tasks on the Malcomesius. He appeared to have greater difficulty retaining numerals than he did reproducing letter strings he had seen. His scaled score on the Coding subtest of the WISC-R was a weakness at 6.

Subject G's Full Scale Intelligence Quotient as measured by the WISC-R was in the High Average classification and fell at the 75th percentile. His Verbal and Performance scores were the same. Relative to his own mean, strengths were seen in the Comprehension and Object Assembly subtests, with scaled scores of 13 and 15 respectively. His weak areas have already been mentioned. They were in Arithmetic with a scaled score of 7 and Coding with a scaled score of 6. His low scores in Arithmetic (-3 from his mean) and Coding (-5 from his mean) combined with a depressed score in Digit Span (-2 from his mean) may be indicative of a third factor, or Distractibility Factor, being operative. Sattler (1982) recognizes that the Freedom from Distractibility factor is hard to interpret and acknowledges that it may involve attention, concentration, numerical ability and short term memory.

Looking at his auditory memory skills, Subject G's age score for retention of unrelated words was higher than his score for meaningful sentences as measured by the _Detroit_. Scores were 9 years 3 months and 8 years 0 months respectively on those two measures. His scaled score on the Digit Span subtest of the _WISC-R_ was 8. When he attempted auditory analysis of words and sentences on the Syllabication subtest of the _Fullerton_, Subject G experienced great difficulty. His score was just short of three standard deviations below the mean.

Formal tests in Language indicated little pronounced difficulty. His scores on Processing Relationships and Ambiguities on the _CELF_ were well above criterion while his score on the Producing Formulated Sentences on the _CELF_ and his ratings on the Grammatic Competency subtest of the _Fullerton_ were just above criterion and the mean respectively. His Divergent Production score as measured by the _Fullerton_ was below the mean.

Since high Picture Arrangement scores can be indicative of good planning ability, Subject G's scaled score of 15 was of particular interest. He had been rated as disorganized by both of the teachers rating him. As his only nonacademic subject was in Physical Education and his teacher for that subject was hospitalized, Subject G was the only subject in the present study who was rated by teachers in two academic areas. He was also the only subject not receiving assistance in a resource room. His English teacher gave him a score of 41 on the questionnaire and added the comment: "_________ looks for ways to avoid assignments." Subject G's Math teacher noted, after giving Subject G a numerical rating of 25, that he had no sense of direction or purpose and lacked confidence.

> No sense of direction - purpose.
> Lack of confidence.

The Rods Task--Subject G

Sequentially, the subtask sequence of the Rods Task moved from Free Performance 1, or Trial 1; to Pairs Choice; to Free Performance 2, or Trial 2; to Final Choice; and then to Independent Test. Following the task, metacognitive questions were asked. Before the experiment began, and after it concluded, subjects were asked to name all the things they thought "mattered for bending."

Free Performance One

Subject G was unable to use the control-of-variables strategy in the first Free Performance Trial. He made ten tests and mentioned five of the expected variables. He tested two variables using unconfounded tests: material and length. He also made what might have been termed an unconfounded test of base but did not show by his explanation that he understood that he was testing base.

His verbalizations were descriptive and to the point. They reflected what the tests showed: that, while he could describe the rods accurately and was aware of a range of variables for most tests, he did not see the importance of doing unconfounded tests.

Free Choice

Subject G was able to accurately judge the better or unconfounded test in all five of the tests presented to him. He tended to describe two or three variables as being the same or different, and when the examiner asked, "Any other reason?", he usually described another variable.

Examiner:	. . . which set is better to find out if the base matters for bending?
Subject G:	This set.
Examiner:	O.K. why?
Subject G:	'Cause - the same material, the same diameter and the same length.
Examiner:	O.K. Anything else?
Subject G:	Bases are different.

Free Performance Two

Subject G did not use the control-of-variables strategy in the second Free Performance Trial. He made an unconfounded test of just one variable: base. In testing, he made reference to all six expected variables. He was one of two subjects in the study to name all the variables while working.

Interestingly, he announced, with a touch of annoyance, that "I already know this stuff." However, he moved directly to his next test without being encouraged to do so. As in the first Free

Performance Trial, but exceeding the number mentioned in that trial, he described a number of variables when he did a test. He did five tests, listing five variables for three of the tests and four on another.

Final Choice

Subject G made just one error in the Final Choice phase. He was required to answer yes or no to seven questions which asked him to judge whether an examiner-displayed set of rods was a good test of a specified variable. He made clear explanations. For example, when asked if 60-3-W and 60-3-W would be a good pair to see if weights mattered, he replied that they would "because they have the same base, same diameter, same length - and same material."

Independent Test

When asked to construct a test of his own to show one thing "which mattered for bending," he was unable to do so. His example was a test of material confounded by length.

Metacognition

Prior to the Free Performance Trial, Subject G named one possible variable which made a difference for bending: length. Following the Independent Test, he listed four variables. The three mentioned, besides the length, were thickness, material and base. Despite the fact that he was able to describe and name the variables repeatedly throughout the experiment, he did not name them all at this point.

When asked if he had changed his mind from his initial position, he replied, "No." He also responded with the single word "No" when asked if he had learned anything from doing the experiment.

The Text Search Task--Subject G

The Text Search Task was divided into three parts. The first part consisted of an introduction of the materials, a demonstration of the principal features of the text (without describing their use) and an open-ended instruction to find the answer to a specific question. The second part was an elicitation phase which consisted of a three-part demonstration of text search strategies of varying efficiencies from which subjects were to select the best approach. The third part of the session was another open-ended question which permitted subjects to demonstrate any changes in strategy use.

Trial One

Subject G utilized a modified type 3 strategy and successfully found the location of the answer to the first question posed to him. The strategy was termed modified because he did not use the table of contents but only the index. Indeed, he went immediately to the index, utilizing an appropriate key word, and obtained the correct page number. Turning to the page, he located the approprite area.

Demonstrations

When asked to select from the demonstrated approaches of locating the answers to two other questions, Subject G chose the type 3 strategy for both demonstrations. His reasoning in the first instance was somewhat vague. He made an interesting point in the discussion over Demonstration 2 regarding use of the table of contents.

Demo 1

Subject G: Last one - because you were organized - you could find it right away and you knew it was what you were looking for.

Examiner: O.K. What do you think about the other methods that I used?

Subject G: Well, they're not bad but kinda sloppy and you don't know if you had the correct assignment.

Demo 2

Examiner: O.K., which of those three is best?

Subject G: Well, the last one.

Examiner: O.K., and why?

Subject G: Well, it's easier to find rather than paging through a whole book.

The examiner then attempted to see if Subject G was aware that in this example the index referenced a series of pages in the text where information could be found.

Examiner: K. Were there any other advantages to it this time? Basically, you gave me some good reasons last time - did you see any further advantages this time.

Subject G: No.

Examiner: Ah - if you turn to page - to the index again - plants - it said 70 to 72 so what does that help us with?

Subject G: The pages?

Examiner: Yeah . .

Subject G: Well, I think there's kind of a - a - well, it's a little bit more difficult - I can't see why you wouldn't just look in the index and then look under "p" for plants - when you get there, look for algae - then go . .

Examiner: O.K.

Subject G: To this page.

Examiner: Rather than starting with the table of contents?

Subject G: Yeah.

Examiner: You would just use the index to start with. O.K.

Trial Two

In completing Trial Two, Subject G mentioned both the table of contents and the index, despite his previous objection to using the former. He qualified his statement by saying, " . . . sometimes there might not be a thing in here so you could look in the table of contents and see if it was in there but I always look in the back just . . . " He used a type 3 strategy and, as he had used a type 3 strategy in Trial One, he was classified as a spontaneous user of the Text Search strategy. He worked quickly and efficiently to find the correct location. He did not, however, use the table of contents.

Metacognition

In comparing his performance on the two trials and outlining the differences that he perceived, Subject G stated that there was no difference. Once again he acknowledged the difference between the demonstrated type 3 strategy and his approach.

Subject G: There wasn't any difference.

Examiner: O.K.

Subject G: It was just - well - I think the way you did it was better but I think what I did - it was faster.

Examiner: O.K.

Subject G: Because there might not be it in there and then if you check in the table of contents you don't see it there then there's no use lookin' around but it doesn't matter at school.

Examiner: O.K., so you think that your way is pretty good and pretty efficient - and you did it in the same way twice basically, didn't you?

Subject G: Yeah.

Subject G seemed very aware of his knowledge and how he regulated his actions. He knew how his method varied from the demonstrated method but consistently stayed with his own. He said the use of the table of contents was what he had learned from doing the Text Search Task but qualified his statement by saying that in school he was told that the book would contain the topic under discussion. He suggested in response to the examiner's questions that the library might be a place where using the table of contents would be useful.

In summary, Subject G knew what he had learned. He regulated his actions on the basis of his knowledge but consciously did not employ new-found knowledge in his regulation.

The Errand Planning Task--Subject G

In the Errand Planning Task, the subject was essentially required to organize a list of errands. He was to decide which errands he would do, the times at which he would do them, and how he would get around from errand to errand. Sequentially, the subtest sequence was a Free Performance step in which he was given two opportunities, Trial 1 and Trial 2, to plan and verbalize his strategy; a series of three pairs of scenarios which he had to judge as to their relative efficiency; and another Free Performance Trial, or Trial 3. Following the task, metacognitive questions were asked. Trials were compared by examining student references to movement, time and errands, and for that reason the discussions will be in terms of those three elements rather than a sequential description of performance of the task elements.

Movement

Subject G's references to specific movement were quite uniform from trial to trial in the Errand Planning Task at 12, 10 and 12 for the three trials respectively. He appeared to use specific movement references spontaneously. He used all three modes of transportation from the beginning, dropping his references to walking slightly from Trial 1 to 2 but returning to the same number of references for Trial 3. References to use of the bus remained the same on Trials 1 and 2, increasing slightly on Trial 3. Bike references were also identical on the first two trials, dropping by one reference on the final trial. On Trial 1, he walked most often, on Trial 2 he used the bus most often, and on Trial 3 he used walking and bus transportation equally.

The average number of total movement references made by subjects of the present study were 16.71, 15 and 12.57 respectively for the three trials. Subject G made 21, 15 and 18 references to movement while outlining his plans for accomplishing the errands.

Demonstrations

Subject G chose the preferred sequence on all three of the paired demonstrations. He missed the most obvious problem with the unpreferred sequence in the first demonstration; namely, the long wait at the dentist's. He saw that more errands were done on the preferred sequence and also felt having the bike would allow him to go faster. He saw the errands were closer together and many could be on the way to doing something else on the preferred choice. His reasons for his choice on the second demonstration had to do with clustering errands and setting priorities.

> Subject G: Well, the first one - because it's more you don't have to go as far, like - way down there as you do up there and you're closer to home - and you got - ah - you didn't do more things but you had enough time to study and get the important things done.

In his final explanation he repeated the accomplishments of the preferred choice and made a comment regarding time which was somewhat questionable. He did not make reference to the backtracking aspect of the unpreferred sequence or the poor use of time entailed.

Time

The demonstration phase of the Errand Planning Task may have elicited an improved reporting strategy for Subject G. He made only one reference to time on each of the first two trials but increased his references to five on the final trial.

Errands

Subject G seemed to use errand references spontaneously, doing 11, 12 and 10 of the thirteen possible errands respectively on the three trials of the errand task. He omitted two errands on the first trial: he didn't get the potato chips or go to the dentist. On the second trial he missed only one errand, the dentist again. On the third trial he only inferred picking up the record and omitted picking up the chips and watching the T.V. show.

Metacognition

Subject G seemed to be aware of how he had planned differently on Trials 1 and 3 in terms of some specific events. For example, he thought his last plan was better because he included the important dental appointment even though he forgot the chips. The examiner extended several probes regarding specific differences in the plans, but first she asked Subject G to explain what he had learned about planning and to evaluate his own planning.

Examiner: Do you think you learned anything about planning today?

Subject G: Yeah - never forget your dentist's appointment. Oh, just organize things or maybe even write 'em out and then time yourself or something - measure how much time it would take if you - for each thing.

Examiner: K. What do you think about the planning you did today? Did you make a good plan by the time you were finished today?

Subject G: Mmm - the last one was O.K. - It was better than the first one because, well, I went to my dentist's appointment - it was better than missing out a bag of chips.

Examiner:	What do you think some of the important things are to take into account when you're planning?
Subject G:	What would be the fastest and easiest and most important.
Examiner:	Good. Do you think you took all those important things into account when you did your planning?
Subject G:	Yeah, as much as I could.
Examiner:	What makes you think you did?
Subject G:	Well, I just thought which would be the easiest route to get to my house and get the most errands done and then on the way to the grandparents and on the way back the things we could get done in time to get to the party.

Subject G gave some important insights when further probes were extended. When asked about the nature of changes in his plans in terms of how he got around, he said, "Well, probably based on the most important to the least important - did the most important first and then the least . . . " Through this statement, he was really saying how he priorized his errands, not evaluating how he got around. Four more specific probes did not yield any more information regarding a comparison of modes of transportation from trial to trial. In reference to time, he thought his last plan was the better. This was in keeping with his actual performance. When asked if the changes he made in time references were important, he replied in terms of efficient use of time rather than quantitative time references when he said, "Well, I was more organized and I was switching little things around so that things that didn't take very long would be at the end."

The examiner appears to put words in Subject G's mouth regarding the comparison of the number of errands he had done. This statement, however, was based on an earlier comparative statement he made regarding the first and third trial. Subject G seems to have erroneously thought that he had done more errands in his final trial than in his first. He actually referred to the same number of errands on both trials and only inferred to one on the third trial that he reported doing on the first trial.

Examiner: Ah, did you think you referred to the errands clearly as you talked to me about your plan?

Subject G: Yeah, but not really as clearly as I could think in my mind, I suppose - it's hard to say.

Examiner: Why do you think you got done more errands in one plan than another?

Subject G: Because I timed it out - and spaced it - and . .

Examiner: The timing and the transportation.

General Comments

Subject G was very involved in the errand task. As the materials were being explained he attentively looked at and examined the map. When the examiner began to read the scenario he followed with his eyes on his copy. He started verbalizing his own plan approximately fifty seconds after the examiner completed reading the scenario. He asked one confirming question during that time. His second trial was begun just four seconds following the examiner's last preceding directive, while a six-second period occurred at the conclusion of the examiner's instructions before Subject G started his third trial.

Subject G made frequent references to the written scenario as he planned his day in Trials 1 and 3. In Trial 1 he made thirteen references, pausing each time he made reference and keeping his eyes on the paper on occasion while he spoke. He made only one reference to the written page during his second trial, seeming to have committed most of the requirements to memory. During the third trial he followed a different pattern. He lifted up the paper, holding it in one hand throughout his verbalizations. For the most part, his eyes were on the paper, being lifted essentially only when he pointed to the place he was talking about.

Subject G tended to progressively move his gestures from the surface of the map to the air above the map. He reduced the amount that he followed routes as he worked.

The Self-Ordered Task--Subject G

The Self-Ordered Task consisted of organizing and carrying out a series of pointing responses. Each subject was required to touch pictures in a sequence according to a plan which he initiated and monitored. There was a high nonverbal visual memory component in the task.

Subject G worked slowly and methodically through the Self-Ordered Task. He ranked 6 out of 7 in all four sets in terms of speed of completion. There was an increase of 109.51 seconds between the times taken on set 6 and set 12. Each set took considerably longer than the previous one to complete, in keeping with the increasing difficulty of the task. Time increases between sets were 29.14 seconds from set 6 to set 8, 30.86 seconds from set 8 to set 10, and 49.51 seconds from set 10 to set 12.

Subject G had only one error score which was greater than any of the normed groups. His error score on set 8 was higher than the mean error score of the normal group but lower than the mean error scores of both frontal lobe groups. His total error score was less than the total mean error scores of all three normative groups.

The Questionnaire On Organizational Skills--Subject G

Procedure

Transcripts of responses to the Questionnaire on Organizational Skills were examined for general impressions. The tone or feeling conveyed was described, the emphasized topics were discussed, and example quotations were extracted.

Using the transcriptions and themes from the twenty questions which were made up on the Questionnaire on Organizational Skills, subjects' responses were grouped into six separate organizational skills: general organization, planning, inspection, regulation, verification, and correction. The use of examples and spontaneous utterances was examined as well as the frequency of responses which were yes, no, or situation dependent. By quantifying these responses, subjects' performances across these organizational categories were examined, and an attempt was made to see how subjects viewed themselves in terms of strengths and weaknesses, as well as how those views compared to the descriptions of their teachers when those instructors answered the same questions.

Meaning units were also examined for preciseness. Descriptors were: word, comment and elaboration. Each of these descriptors was further categorized as general or precise. Statements were also examined to see if they reflected spontaneous replies or whether they were simply agreements/disagreements or parrotings of the examiner's words. In essence the majority of statements showed subjects' agreement or disagreement with a posed question. Thus, those so labelled were limited to words or comments which served no further purpose and gave the examiner no knowledge beyond if the behaviour was engaged in, not employed, or sometimes utilized.

General Tone

Subject G's responses were primarily composed of spontaneously elaborated responses. It was not necessary to probe extensively to gain further information when questioning him. Subject G stressed his nonconformity, and some of his discussion centered on describing how he "beat the system."

> Subject G; Well, I find out what the assignment was, then I'd do that assignment and then I'd do it as fast as I can - whether it was right or wrong so that when they simply walk by it would look like I did it - then when they were correcting or something I'd put in the right answers . .

He repeatedly attempted to convince the examiner that he was fairly blase about his work.

Examiner: Do you check for errors when you're finished an assignment?

Subject G: Yeah - I just look over it and then - if it doesn't look right or it doesn't work out then I just - I sit there for awhile and then I work it out and if it don't work out - well, that's too bad. (laughs)

A number of his statements lacked the detail which would have given insight into his task approach.

Examiner: Do you see errors as you work through an assignment?

Subject G: Yeah, O.K.

Examiner: Do you have a method of looking for errors?

Subject G: Yeah. (laughs)

Examiner: Can you describe what it is?

Subject G: If it doesn't feel right . .(laughs)

When further describing the method he used in finding errors, he said, "Well, if it doesn't - go with the flow, well - not really it . . ."

There was an undercurrent of responsibility in Subject G which surfaced from time to time as it did when he was elaborating on the differences between elementary and high school.

Examiner: Do you have or do you feel that you're directed or that you know where you're going when you're doing an assignment? Do you feel like you know where you're going in it or do you feel confused?

Subject G: Yeah, ever since I got into high school I felt that I was - like knew what I was doing all the time - but back in elementary school they'd assign something and sit there and "What page is that?" and I didn't know what I was doing but as soon as I got in high school - I snapped out of my meditation, I guess.

Examiner: Do you think that has anything about high school that caused that or do you think that has something to do with your getting older?

Subject G: Well, old - like getting older - I kind of just said - well, it's time to grow up - you've got to make a living - like when I was in elementary school I thought - school - you didn't need an education - but when I got into high school I started realizing - you got to make a living and stuff and then like when I was in grade eight and ready to go into high school I always thought - oh, no, they're going to be like University - like really strict or I don't know - formal and stuff like that so when I got there - then after about a month I found out they're really not all that strict so I started fooling around and then I sort of smartened up - I guess - tried - and then after awhile in high school - like I always had homework assignments piling up so then became sort of a problem just thinking about 'em . . . so I said, well, do 'em and get 'em off your back.

Subject G's transcripts yielded the following impressions:

1. That he did not wish to conform to the demands of the classroom and would like to give the impression that he worked when and how he chose.

2. That his knowledge of how he learned at school was not as precise as how he interacted at school.

3. That his reported knowledge was fairly detailed but he often did little to inform the researcher of his task approach.

Self-Perception of Organizational Skills

In looking at Subject G's performance across six organizational skill areas, response patterns emerged. He provided a considerable amount of explanation without the examiner extended probes. Fourteen of his twenty responses were accompanied by example. Twelve of those examples spontaneously followed the examiner's first question (see Table 88). He responded "yes" most frequently to the questions posed by the examiner, with thirteen affirmative responses. Three other statements were "sometimes" or situation dependent responses. He made only four firmly negative replies and three of them were in the skill area of Regulation. He reported that he did not begin assignments right away, that he did not work out alternate solutions to problems, and that he did not make corrections as he worked. He also reported that he did not tend to hand in a polished product.

By quantifying his responses as described in Steps Twelve through Fourteen of the procedure for analyzing the Questionnaire On Organizational Skills found in Chapter V of the present study, it was possible to ascertain Subject G's relative ratings of himself on the six organizational skills being examined. Through this step, it was seen that Subject G rated himself lowest in the area of Regulation skills and highest in both Inspection and Verification skills.

Comparison of Self-Perceptions with Teacher Perceptions

Subject G's quantified scores and relative rankings were then compared to how he had been rated by his English and Mathematics teachers. Subject G was the only subject in the present study who was not rated in a less academic setting. This variation was due to the facts that Subject G was not in any classes which were not primarily academic and was not receiving resource room help.

Both of Subject G's teachers gave him identical rankings, placing General Organization highest and Verification lowest. There was no similarity between those rankings and Subject G's opinions. Indeed, the teachers saw Verification as his weakest area whereas he had felt he used those skills most effectively.

Subject G described himself as disorganized and felt his teachers would view him the same way. Indeed, both teachers rated him as disorganized; however, the numerical rating assigned him by his Mathematics teacher was much lower than that of his English teacher. Of Subject G, his Mathematics teacher wrote:

> - No sense of direction - purpose
> - No care in written assigenemnts
> - Poor listening skills
> - A lot of his poor work habits could be due to a lack of confidence

His English teacher commented:

> _________ looks for ways to avoid assignments. However, he is a pleasant student. He sometimes uses bad language, especially when teasing others (a favorite pastime).

Preciseness of Verbalizations

In examining each meaning unit for preciseness, it was found that Subject G's verbalizations were primarily in the category of General Comments (see Table 93). It should be noted as well, however, that Subject G made more precise elaborations than any other subject in the present study, except for Subject C who made the same number.

Seventy-six percent of Subject G's statements were his own. That is, they were not composed of simple agreements/disagreements or parrotings of the examiner's words.

The Interview Regarding Study Habits--Subject G

Themes from Questions 3, 4, 6, 7 and 9 from the Interview found in Appendix J were examined and labelled as to whether they reflected the subjects' knowledge of their study and work habits or demonstrated their awareness of their ability to regulate those habits. Criteria for assignment of "knowledge of" or "regulatory" labels were adapted from Brown and Palinscar's 1982 discussion of metacognition and may be found in Table 95. In an example, a verbalization identifying a research technique such as "looking it up in books" is a knowledge statement regarding study habits, while a subject saying that he "started [researching] early because I found I needed all the time I could get" shows a regulatory component.

Notation was also made when the subjects did not seem to know how they could intervene to change an ineffective habit. "Knowledge of" labels were further defined as general or specific. As well, total theme and spontaneous theme patterns were established by ranking the number of statements falling into the two "knowledge of" and the "regulatory" categories.

The stipulated sections of Subject G's transcript were divided into twenty themes. One of his statements reflected an inability to regulate his actions. Rather than seek alternative ways to write a paper, he would simply copy someone else's work. Four of his statements were labelled as being more reflective of the examiner's ideas than his own.

In analyzing the themes and underlying transcripts of Subject G's responses in the Interview Regarding Study Habits, a pattern emerged (see Table 103). Subject G's themes were almost entirely labelled "knowledge of." Only three of his twenty themes reflected "regulatory" components, and only one of those was spontaneous. The "knowledge of" statements themselves contained more general than specific statements, although the difference in the two subcategories dropped from four to two statements when only the spontaneous statements were considered.

In summary, Subject G's verbalizations were almost entirely "knowledge of" statements in which the number of general labels exceeded the specific descriptors. The total theme and spontaneous theme patterns were constant. However, a more detailed examination showed that "regulatory" and specific "knowledge of" statements both declined somewhat when the analysis was limited to spontaneous remarks.

The examiner felt that Subject G saw his school experience as a kind of game. He prided himself in bending the rules and "pulling one over" on his teachers. His verbalizations showed many examples of how he enjoyed establishing and following his own code. He was pleasant and open during the interactions.

As mentioned previously, Subject G would copy someone else's work if stuck for information for a paper. As he put it, "I don't make no special trips to the library," and he went on to add ". . . just ask Mom and Dad if we had any books on the subject . ." He continued to paint a nonchalant picture of himself when asked what he would do if the teacher asked him to read a chapter in a textbook.

Subject G:	(laughs) First of all, I wouldn't read it - but (laughs)
Examiner:	You wouldn't read it?
Subject G:	No.
Examiner:	What if it was in class?
Subject G:	I'd just sit there.
Examiner:	You'd still just sit there?
Subject G:	Yeah - well, I'd look at some of the headings and look at the pictures like - pretty well pick out what it's about but not like in big detail . .

Later he said:

Subject G:	Yeah, I'd look at it and if I thought it was boring then I'd just leave my book open and sit there and meditate. (laughs)
Examiner:	O.K., and if it wasn't boring?
Subject G:	Well, I'd read it a bit.

Although he was able to describe his approach to remembering how to spell difficult words in some detail, it was a vague explanation. The generalities of his descriptions were exemplified in the following initial description of his exam study techniques.

Subject G:	Well, I'd - ah - take my books home - go to sleep - get up - eat - go to sleep - and then I'd get up and read over it and

> then just read it and just read it and then I'd just try to interpret - interpret it . .

Subject G seemed aware that he was not utilizing acceptable study habits, and almost seemed proud of the fact. His perception of his school problems was that they were caused by the fact that he was forced to attend classes. His grasp of the relationship between the effort he exerted and his success was somewhat ambiguous, as seen in the following discussion about his intellectual ability.

Subject G:	Oh, well, a couple of the teachers said that I had the ability to do it, that I just wasn't workin' - got too much [mumble] to do -
Examiner:	How do you feel about that - when you're told that?
Subject G:	Well, I say I'm tryin' my best - it's the only thing I can do . .
Examiner:	Do you feel you try your best most of the time?
Subject G:	Yeah, pretty well my best - I could maybe try a little harder - but it wouldn't help much.
Examiner:	How do you feel about learning that you have good intelligence?
Subject G:	That I could probably use it if I really tried.

FOCUS

In Chapter VI, the patterns seen in individual subject's responses and behaviours have been outlined in case study formats.

The characteristics and personalities of each study participant are clearly evident in these discussions. The emotional aspects of the subjects' words and actions have been afforded an important role in the descriptions and help to make the task performances more meaningful. The reader is referred to Chapter V for the group trends which were seen in specific tasks and metacognitive skills.

CHAPTER VII

CONCLUSIONS AND IMPLICATIONS

The purpose of the present study was to attempt to make a contribution to the understanding of the nature of the task approach of learning disabled adolescents with organizational difficulty. Through four separate tasks and thirty questions, it was anticipated that qualitative information would be gleaned which would add to the meager literature on the specific nature of inefficient learning and poor strategy use.

The methodology which was employed included both participant observation, in a structured setting, and interview techniques. The data for the present study were the words and the actions of each subject. Recordings of the data were made on both audio and video tape. Transcriptions and subsequent data reduction yielded themes which, along with the content from which they came, were examined both in terms of the purposes of the study and in a less focussed manner so that they might yield information outside of the constraints of the researcher's framework. The methodology generated seven in-depth case studies and permitted the examination of strategy use across tasks, as well as the study of the subjects' understandings of their task approach.

An expectation of the writer was that data would be gathered upon which hypotheses could be based. Limited as it was to seven subjects, the present study did not generate theory but laid foundational work on which to base further research into the problems experienced by learning disabled adolescents in their attempts to organize conscious activity. Although clinical data on ability as well as academic, language and processing skills were gathered, the present study went beyond the consideration of these traditional elements as the basis of school failure. An attempt was made to examine the study skills and strategy implementation of the subjects and to consider the contribution of these factors to poor school performance.

The evidence gained through observation and questioning suggests areas from which future theory might develop if the results of subsequent investigations, conducted with similar methodology, are compliant with the present findings. Further, if subgroups are to be defined in the area of organizational difficulty, consistent patterns emerging from longitudinal investigation will need to be documented. The present study is an initial step in the pursuit of such patterns.

Given the nature of the present investigation, the conclusions are stated in the form of grounded speculations; evidence from the research shows how they evolved. Trends and patterns are outlined as supporting evidence for these speculations. Finally, the implications for educational practice as well as implications for further research are discussed.

The depth and complexity of the present work precludes discussing all the speculations arising from the data. For the most part, the writer has tried to outline conclusions which were drawn from transsituational data; that is, data from more than one element of the study which showed the same trend. There are included as well, however, statements which show a commonality in response from the majority of subjects in commenting on one task or in answering a particular question.

SPECULATION ONE

The ability to correctly judge the efficiency of the task approach of another and the ability to verbalize the concept behind the use of a preferred strategy seems to have little effect on the ability to implement the strategy.

Discussion

Subjects were able to evaluate the efficiency of task demonstrations and pick out, after observation, examples of "best test" or "best strategy" on the Rods Task and the Text Search Task respectively. This was done on repeated occasions, especially in the Rods Task where ten to twelve opportunities were afforded each subject to evaluate different approaches to the task. Indeed, the most errors made by any subject on the Rods Task, when errors from both elicitation phases were summed, were four on eleven trials (Subject F).

Subjects also seemed to understand the concepts behind good strategy use in the Rods and Text Search Tasks. All subjects were able to explain, with varying degrees of efficiency, the principles underlying the tasks. In the Rods Task, for example, they understood that using a pair of rods of varying lengths would interfere with seeing how varying diameter affected the degree to which the rods of the same material would bend when weights of an equal amount were used. As well, they knew that the use of the index with the table of contents was more efficient than using the table of contents or engaging in random flipping when trying to locate specific information in the Text Search Task.

The interesting further outcome of the two tasks presently under discussion was that the knowledge which had been verbalized by the subjects could not be demonstrated by about half of those being studied. Specifically, three subjects could not regulate their actions by their knowledge. Subjects A, D and G, in the Pairs Choice and Final Choice phases of the Rods Task, made 9 out of 10, 7 out of 10, and 11 out of 12 correct choices respectively during the demonstrations. In addition, as mentioned, they verbalized an understanding of the task. Yet, when asked to construct a test independently, they could not do so. A similar pattern was seen on the Text Search Task, although there were only two opportunities to judge demonstrations for Subjects A and G and just one opportunity for Subject D. In the Text Search Task, the three subjects accurately told what should be done but used a different strategy than the one they said was best.

The inability to move from knowledge to application of that knowledge is not undocumented in the literature. For example, Cavanaugh and Borkowski (1980) did not see a direct link between metamemory and memory strategies in their subjects. Baker (1982) stresses that the casual relationship between metacognition and cognition is not understood. What seems to add to the complexity of the issues involved between understanding and using a strategy was that in the present study subjects could not only verbalize a concept but could repeatedly and correctly evaluate the performance of the researcher, when she demonstrated strategies, by choosing the most efficient of the strategies displayed to them. In that respect, the present study may be unique and most certainly adds further interest to the question of discrepancy between spoken understanding and actual demonstration of a skill.

The discrepancies among verbalized metacognitive knowledge and regulation statements; evaluative judgements with concrete materials and actual performance will herein be addressed from three perspectives. The literature on automaticity, developmental maturation, and learned helplessness all make contributions to the understanding of this phenomenon.

Automaticity

The value of automaticity in skill acquisition has been recognized for some time. Teachers in the elementary schools have long been aware of the variance which exists between their students' knowledge and the application of that knowledge by those same students. Phonics is an example in point. It is often found that a child can state a rule such as "When two vowels go walking, the first one does the talking." and may, as well, be able to give an example of a word which adheres to the rule, however, when the same child is asked to read, he often makes errors in words such as pail and float. Perhaps the most common example of this application-of-rule difficulty lies in the final e rule, when cvc words containing a short vowel sound are confused with cvce words which have a long vowel sound. It might be argued by those reading specialists in the "bottom-up" school of thought (Gillingham, 1965; Liberman and Shankweiler, 1979; Perfetti and Lesgold, 1979) that what is occurring in such situations is that the student has not as yet reached a level of automaticity in the individual sound symbol associations and/or word pattern recognition to read with accuracy, especially when reading in context. Dale Bryant's (1965) work stresses exactly this point. He advocates that, in working with children who have reading difficulty, one must limit the number of perceptual associations introduced simultaneously, striving to achieve automaticity with each element or letter and then using only those known letters in basic word patterns. He suggests introducing just one new letter at a time, slowly integrating into words only the letters which have been overlearned to the automatic level in isolation.

The role of automaticity in freeing the individual from attending to less complex foundational skills and permitting advancement to and integration of more difficult skills based on those underlying skills is found elsewhere in the literature. Information processing models, such as those purported by LaBerge and Samuels (1974) and Lesgold and Perfetti (1978), discuss what Stanovich (1980) terms a "trade-off among processes sharing a limited pool of cognitive resources" (p.64). In his own work Stanovich (1980), in reviewing the literature in reading comprehension, has concluded that good readers are distinguished from poor readers by two factors: more rapid context-free word recognition as well as superior phonetic segmentation and recoding abilities. He concludes that:

> the existence of this rapid context-free recognition ability means that the word recognition of good readers is less reliant on conscious expectancies generated from the prior sentence context. The result is that more attentional capacity is left over for integrative comprehension processes.
> (Stanovich, 1980, p. 64)

It may be that, in the present study, independent demonstrations of the verbalized strategies required a level of automaticity not yet mastered by some of the subjects. In pursuit of this possibility, it is necessary to consider automaticity in a perspective other than from that of learning a basic skill, a simple association or even a single word or word attack skill. It may be in a consideration of automaticity in terms of concepts and strategies that the answer lies. Case (1978), in outlining his neoPiagtian theory of intellectual development, discusses his contention that automaticity plays a very important role in the child's ability to utilize more complex executive strategies. He believes that both responsiveness to strategy-related experiences and a gradual increase in working memory help to explain the succession of qualitatively distinctive executive strategies which generate a succession of substages within the major stages of intellectual development. He states:

> The gradual increase in working memory does not stem from a structural increase in the attentional capacity of the organism but rather from an increase in the automaticity of the basic operation it is capable of executing. As these operations become more automatic, their execution requires a smaller proportion of total

> attentional capacity. The result is that more capacity is available for "storage" or "working."
> (Case, 1978, p.64)

Case (1978) also believes that transition from developmental stage to developmental stage depends on automaticity.

In viewing the lack of ability of Subjects A, D and G to apply their verbalized knowledge to manipulatives in light of Case's (1978) theory, one might assume that, although the subjects could verbalize the concepts behind the efficient strategies and evaluate task attempts on the basis of those concepts, the level of automaticity required to actually carry out the tasks had not been achieved. Essentially, what these three subjects could not do, despite their knowledge, was to regulate their behaviour. The difference between "static knowledge," or the verbalizable things which people say about their cognition, and "strategic knowledge," which "consists of those steps actually taken to regulate and modify the progress of cognitive activity when it actually occurs" (Yussen, 1985, p. 256), is an accepted delineation. The terms static and strategic are attributable to Baker and Brown (1984), who outline four components of the strategic knowledge: planning; predicting; guessing; and monitoring. These stages are not unlike the distinctions made in Brown's earlier work (Brown and Palincsar, 1982).

Development

The four developmental stages of verbal regulation of behaviour presented by Luria (1961) progress from external adult speech regulating the child's actions; to the child's own spoken words taking on the function of regulation; to the rising importance of the content of the child's speech; to the child's inner speech regulating his behaviour. These stages are based on Vygotsky's (1962) theory of interpsychic and intrapsychic behaviour. In the present study it would appear that despite their ages, Subjects A, D and G may not have reached that final stage. Yussen (1985) has said that "the state of one's cognitive readiness is a highly salient and general matter to be reckoned with by everyone" (p. 262).

Wellman (1985) briefly indicates that he does not expect that the metacognitive knowledge characteristics of young children which he describes "would have much bearing on the child's use of various cognitive strategies to enhance the outcomes of specific performances" (p. 30). This statement further supports the theory of a developmental aspect to conscious control and regulation of goal-orientated strategies, which has been recognized in the literature for some time (Vygotsky, 1962; Brown and Deloache, 1978; and Yussen, 1985). From the developmental standpoint, one could argue that the subjects of the present study were simply not ready to grasp the concepts which would permit them to employ the required strategies. It would seem that Case's (1978) theory of automaticity would be additional support, giving greater depth to the developmental argument.

Sternberg and Wagner (1982) have said, in comparing the skill levels of the learning disabled to "normal" learners, that: "in a learning disabled person such automatization in a given area of functioning occurs at an unusually slow rate and often to a lesser degree" (p. 2). It must be stated that it is not the intention of the writer to engage in the "delay vs. difference" debate by trying to simplify learning disabilities into a straightforward lack of "readiness." It has been discussed, earlier in this dissertation, that qualitative differences have been found in the task performance of children experiencing learning problems when they do acquire strategies (Brown and Deloache, 1978; Day and Stone, 1982). As well, the complexity of learning disabilities have been acknowledged (Kurland and Campione, 1982; Torgeson, 1982b; Cartwright, Cartwright and Ward, 1984; Kavale and Nye, 1985-86). No one pat solution to an involved issue is being purported here.

Learned Helplessness

As a third possibility for the explanation as to why three of the subjects did not carry through by effectively demonstrating strategies which they had verbalized, the phenomenon of learned helplessness will be considered. Thomas (1979) has described the learned helplessness as a "phenomenon by which an individual learns, over a series of trials, that she/he has no control over the outcome of events" (p. 209). Based on early work of Mowrer (1960) who wrote of hopelessness, learned helplessness has been experimentally evoked in previously successful students by structuring continued failure experiences (Thornton and Jacobs, 1977). Researchers have also described the learned helplessness phenomenon in children who have undergone failure repeatedly in their academic endeavours (Dweck and Reppucci, 1973; Dweck, 1975; Thomas, 1979; Wittrock, 1986). Such individuals do not feel that they can succeed and therefore may not try to complete the tasks required of them. Essentially they have not established the belief that they can control their academic success by exerting sufficient effort. If they don't try--they can't fail.

In relationship to the present study, the learned helplessness argument might, at first glance, seem to have the least validity of the three possibilities discussed (the others being developmental factors and automaticity) since all three subjects did attempt and complete the tasks involved. However, their performances did not reflect their spoken and evaluative knowledge. It is in the consideration of the individual with learned helplessness as someone who may exert reduced effort, where the inclusion of this perspective becomes worth considering. Perhaps the subjects' histories of failure may have contributed to them exerting less concentration in their attempts at the final independent trials of the Rods and Text Search Tasks. However, this assumption is difficult to support without further evidence. Open-ended interviews showed that the subjects attributed their lack of progress in school to a number of factors. In examining those factors it became clear that the subjects did not all fit neatly into the usual pattern which might have been expected from the literature on "learned helplessness". That is, they did not display the tendency to expect reinforcement responsibility to come from external forces. External attribution was seen only in the response of Subject G. Subject A and D reported they did not succeed because of what Dweck (1973) would refer to as internal reinforcement responsibility, more usually present in achieving students.

In order to fully understand the implication of an attitude of learned helplessness in the subjects who participated in the present study, thorough re-examination of the data is warranted. Subjects' responses to all relevant Interview and Questionnaire probes should be related to specific behaviours on all the tasks incorporated into the present study. The relationship of verbalizations to actions is one which has been rigorously attended to throughout the data analysis utilized in the present investigation. Attitudinal factors deserve no less attention. Cursory conclusions based on single responses could be most misleading. For example, Subject A attributed his poor academic standing to what might be described as stable internal factors if the criteria used by Tollefson, Tracy, Johnsen, Buenning, Farmer and Barké (1982) were applied to his response to interview questioning. However, a quick review of his Case Study shows that he was so dependent on the examiner's responses that he would change his responses if he thought that her expectations had not been met. He was also described as being "helpless" in his approach to the tasks he was asked to do.

Learned helplessness and metacognitive development have been linked in the literature. Cullen (1985) has stated that the manifestation of learned helplessness is partially determined by the availability of metacognitive strategies for coping with failure. Recent work in attribution retraining, in which children relate success and failure to designated causal factors, speaks to the emerging emphasis in the literature on considering antecedent causal beliefs in the degree of sustained effort applied by students to a given task. (Dweck, 1975; Tollefson et al., 1982; Borkowski, Weyhing and Turner, 1986).

Prototype for Understanding

Yussen (1985) believes that, in order to enhance our understanding of the concept of metacognition, we must look at prototypes of metacognitive phenomena as well as developing definitions of the term. The present study provides just such a prototype--carefully recorded evidence of the inability of three adolescents to regulate their activity not only according to their own verbalized knowledge but according to knowledge which allowed them to make correct judgements regarding the strategies employed by another. The interactions of the cognitive, metacognitive, developmental, and affective components in the behaviour just described, have important and far reaching implications for teaching and for research.

Educational Implications

Assuming that students can do a task because they can correctly evaluate another person's performance on the task, or because they can verbalize the concepts behind the task, may be misleading. Certainly this fact has bearing on the more traditional approaches to evaluation used in secondary schools, especially in regard to less academic classes where written examinations are given to ascertain the individual's ability such as in construction or mechanics courses.

More importantly, Speculation One should caution teachers against an "all or nothing at all" approach to evaluations. There appear to be levels of learning and degrees of knowledge. Not being able to complete a task may not mean that the student has no knowledge of what is involved in the task, but may mean that he is in a transitional stage between levels of learning involved in that task. Such an idea is certainly not new in the field of cognitive development: Piagetian scholars have discussed this premise for years, and Flavell (1970), as cited earlier in this paper, speaks for production inefficiencies between nonproduction and efficient production. The present study has pursued this concept of degree of knowledge in terms of ability to complete tasks, and has documented examples across tasks or in a transsituational manner. The present study revealed students who, for all intents and purposes, from the traditional point of view, understood a concept but could not employ it. If students exhibit similar behaviour during evaluations in a classroom setting (from the point of having only to demonstrate their understanding), they may be viewed as lacking the concept. Conversely, if they are only asked to verbalize the concept, their teachers might be well pleased with the expressions they hear, without any suspicion that the students cannot translate their words into action.

Educators might benefit from investigating evaluative procedures which have both "knowledge" and "application" components and which are structured progressively so that the point of breakdown of the individual may be ascertained. Surely the evidence gained in the present study is further support for evaluation procedures which are not based on single quantified scores reported without the suggestion of a performance range.

Case's (1978) contention that lack of automaticity prevents the child from moving forward to more complex tasks has direct implications for daily classroom endeavours as well. Sternberg and Wagner (1982) have said:

> The disabled person again and again must devote attention to tasks that others have long ago mastered. Processing resources that in others have been freed and used to master new tasks . . . . (p. 2)

Teachers who recognize that learning disabled adolescents do not have the basic skills which others possess, and are not ready to move on to more advanced work until they master the fundamentals leading to the more complex tasks, will be more understanding and certainly more effective in their interactions with their pupils.

As well, teachers who understand the complex interrelationships between the amount of effort extended by students and the past failure of those same individuals, will more than likely be able to structure learning environments which encourage and reward risk taking. It is evident that children have different styles of responding to failure and different coping strategies following that failure (Diener and Dweck, 1978; Cullen, 1981). What research has also shown is that effective achievement behaviours are facilitated by what Cullen (1985) terms "the availability of a range of strategies for coping with ambiguity and error" (p.280). Teachers need to be as aware of affective individual differences as they are of the academic skills variations in their pupils. Teachers also need to be willing to invest interactional time with students in helping them to develop strategic approaches in the affective as well as in the academic aspects of school endeavours.

Implications for Further Study from Speculation One

More protocol analyses of the words spoken by subjects who can verbalize and perform a given strategy, as well as those who can verbalize but not perform the strategy, would be of interest. Fernández-Ballesteros and Manning (1984) stress the usefulness of recording verbalized strategies which subjects make while carrying out a task. Certainly in the present study, the audio recordings revealed data which would have been lost had a simple notation method been used. It was through examination of the transcriptions that the verbalizations of knowledge became fully apparent and could be compared across tasks. While the controversy over the use of verbal reports is recognized (Nisbett and Wilson, 1977; Ericsson and Simon, 1980; Baker, 1983), it is a viable approach to qualitative descriptive research (Aanstoos, 1983) which holds much promise.

Studies which continue to investigate the nature of the continuum, which extends from nonproduction of a strategy, through inefficient production to efficient strategy production, should be pursued. Specific investigations into Case's (1978) theory regarding automaticity might help to explain the nature of the bridge from understanding a strategy to implementing it. In such work, the very difficult job of operationalizing automaticity would have to be explored. The interfacing of attribution theory with metacognition, as well as with the practical application of strategy, holds a great deal of promise for future research into efficient and inefficient task approach. Cullen (1985) warns that the "affective state is likely to interfere with metacognitive activity" (p.294). Researchers who disregard students' perceived self-efficacy, as it relates to their beliefs about how they learn and regulate their learning, may be overlooking an integral factor. Of equal importance is the role metacognition can play in changing feelings of powerlessness over learning situations. Cullen (1985) points out that cognitive monitoring has two important roles to play in alleviating helplessness. It, first of all, directs the learner to alternative coping strategies and secondly, it assists the learner to feel in more control of the situation.

Besides studies done with specific hypotheses in mind, work which approaches the question of the nature of transition from strategy absence to strategy implementation could be approached utilizing phenomenological methodology. In these types of studies the data would be examined in an open manner to see what information it might bear. Such investigations would be in contrast to approaches in which the researcher would examine data to see if it answered specific questions established prior to data collection. The latter approach would, of course, also be of value.

SPECULATION TWO

Students' knowledge of their own strategy weaknesses may be quite accurate.

Discussion

Three of the seven students investigated through the present study could not regulate their behaviour on the Rods Task and the Text Search Task, despite being able to correctly distinguish and repeatedly distinguish between good and poor strategy-use demonstrations by the researcher, and despite being able to tell why they evaluated her performance as they did. These were also the three students who rated themselves lowest in ability to regulate when they completed the Questionnaire on Organizational Skills. In short, they described themselves as lacking a skill which they, indeed, did not demonstrate in their task behaviour.

The regulation component of the Questionnaire was composed of four questions: Questions 4, 10, 16, and 20. Those questions were:

Question 4:	Do you begin a task or assignment immediately?
Question 10:	Do you work out alternative solutions to problems?
Question 16:	Do you tend to make corrections as you work?
Question 20:	Do you carry through to the end of an assignment unless you encounter a legitimate problem?

By classifying the students' replies into Yes, No, and Sometimes responses and further, by quantifying those responses, the researcher was able to establish an overall score for each skills area tapped by the Questionnaire. Thus, through this process, a vehicle for comparison of the various skill areas was devised and relative performance on each of the skills could be determined. It was following this procedure that it was determined that the three subjects in question viewed themselves as poor "regulators."

Educational Implications

The writer has long been impressed with the ability of learning disabled adults and adolescents to delineate the processing problems which underlie their own academic difficulties. Such individuals, when seen in a clinical setting, can tell, for example, that they can't remember how a word looks; that they have impaired ability to revisualize linguistic symbols. Standardized testing and further diagnostic work in reading and spelling usually substantiates their descriptions. In the present study, some subjects seemed equally capable of describing their study skills weaknesses.

Listening to the individual as he describes skill deficiencies could be one of the most important tools the clinician has at his or her disposal. Initial interviews, if employed prior to assessment, could assist in the choice of diagnostic instruments and techniques as well as lead toward more efficient program planning.

It would seem appropriate that interview questions include not only inquiries regarding the client's perception of academic skill breakdown but that questioning extend beyond the more traditional scope to include probes into perceived strategy use and organizational skill deficiencies.

Limitations and Implications for Further Study from Speculation Two

It is recognized that the term "regulation of behaviour" is used in a global sense in the previous discussion and that it is most unlikely that it could be directly equated to only the regulation component of the Lurian definition of the organization of conscious behaviour or, more specifically, to the questions which were constructed for the present study to try to tap that component. In all probability, when constructing an independent test on the Rods Task, elements of planning, inspection, verification and correction would also need to be involved. Verbal protocols did not yield sufficient information to make judgements regarding such a breakdown. It might be possible through future detailed analysis of video material, utilizing both timings and nonverbal behaviours, to conduct a further investigation into the subjects' approach to this aspect of Rods Task. Such an inquiry was not conducted with the task question for the purposes of the present discussion.

SPECULATION THREE

Self-directed manipulation of materials towards a goal can generate increased knowledge without any specific elicitation techniques or without any instructional intervention.

Discussion

The just-stated speculation was derived from observation of the Rods Task. It must be emphasized that the statement refers to increased knowledge in the form of the subject being able to name variables he could not name prior to manipulating materials. It does not refer to the implementation of a specific strategy; in this case, the control-of-variables strategy.

In the present study, an examination was made of the transcript to investigate the number of variables named while the subjects moved from stage to stage of the Rods Task. The major increase, overall, occurred through the first independent investigation, an increase from thirteen total mentionings in the Initial Response to thirty-two total in the First Free Performance Trial. For six of the seven subjects, self-directed manipulation of the materials was the most instrumental in drawing out verbalizations. Subjects named variables as they worked. When subsequently asked to list the variables, most could name the majority of the variables which they had spontaneously called out while carrying out the experiment.

In a study done in 1982, Day and Stone investigated developmental and individual differences in the use of the control-of-variables strategy. As one of the four conditions, they used no specific elicitation techniques but simply had subjects complete two successive presentations of a free-performance task. For the older students, specifically Grade 8 students, in Day and Stone's (1982) work, repetition of the task was as useful in bringing out control-of-variables strategy, in those subjects not using the strategy initially, as were elicitation techniques. While the present study was not designed to replicate the Day and Stone (1982) finding, and while no student in the present study was an elicited user of the control-of-variables strategy, the effectiveness of manipulating materials while pursuing the answer to an open-ended question was demonstrated.

Educational Implications

As children move through the grades, there is a growing tendency for their teachers to use formal rather than informal assessment to gauge their progress. In looking only at the results of these formal measures, other learning may not be recognized. In the present study, subjects named variables while working that they did not "test for" using a specific strategy. If careful records and transcriptions had not been made, much of the learning which took place during this task may have been overlooked. It should be stressed that the writer recognizes that simply naming a variable does not constitute an understanding of "what matters for bending." However, such verbalizing of names indicated recognition of the variables involved.

Teachers, especially in the sciences, may discover that students have more knowledge than what has been ascertained on formal measures if they make informal observational notes regarding student verbalizations and watch their pupils' behaviours while the students are working. It may also be true that students in a more relaxed setting may reveal more knowledge than in formal assessment. They may learn as efficiently when given open-ended questions and manipulatives, particularly when they can verbalize their findings in their own words, as they can in more formal experimentation with more verbal instruction.

Implications for Further Study from Speculation Three

Studies which investigate the effectiveness of various approaches to concept learning and strategy acquisition might examine the comparative value of such "passive" techniques as task repetition and manipulating materials in response to open-ended questioning to more teacher-directed approaches such as formal elicitation and traditional instructional methodology. Although the direct approach to teaching is usually recommended over the discovery method for children with learning problems, comparative research of the kind just outlined might yield some interesting findings. Certainly teaching directly and modelling through interactive techniques are two methodologies currently being advocated in the literature (Flood, 1986; Palincsar and Brown, 1986).

SPECULATION FOUR

Students who have experienced years of school failure may be more likely to blame themselves for that failure than to blame the school or their teachers for their lack of progress.

Discussion

Six of the seven subjects participating in the present study internalized accountability for their school failure. This trend did not support the more stereotypic view of the failing teenager who strikes out at the institution which has wronged him. Instead, most subjects looked inward for causes of lack of progress. While on the surface this might seem to be commendable, when the reasons proffered by the subjects are examined, a certain amount of concern is generated.

When a subject with documented, prolonged reading difficulty states that he has had school difficulty because he should "take more time" or "study harder" or "care more," that subject might be assumed to believe that, by taking more time or by studying harder or by caring more, he could "fix" his problem. The responsibility for academic improvement is then placed squarely on that individual's shoulders. If he, in turn, does study much harder, following his own criteria for studying harder, but uses materials which are inappropriate for him because of discrepancies between his reading skills and the level of difficulty of the text being used and/or uses inefficient study methods, he is still most unlikely to achieve. If he accepts total responsibility for his failure, then he is faced with the deprecating knowledge that his increased effort is still not good enough. Such a scenario shows clearly the effect on self-image of the student not understanding the role of his learning problem in his school progress.

Only two of the six students in the present study, who had histories of reading problems, spontaneously suggested that those problems may have contributed to school difficulty. In the writer's opinion, lack of such knowledge gives the pupil much less control over his learning experiences. Self-regulation of learning is widely supported (Deshler and Schumaker, 1986; Palincsar, 1986; Paris and Oka, 1986) but surely such regulation must be based on self-knowledge as well as knowledge of the task.

Educational Implications

The intention behind the present discussion is not to suggest that the student, having been given information regarding his skill deficiencies, would then have an excuse for not applying himself. It is, rather, to be hoped that such a student and his teachers could make more informed decisions regarding materials to use and study methods to employ if they all understood the implications of the individual's learning problem. If the student incorporated changes in his preparations for an examination or an assignment and still did poorly, there would be the possibility of evaluating those preparations carefully with a view to further change. In such an approach, the objective would be toward greater responsibility on behalf of the student to objectively evaluate and change his study habits. The student left only with the general feeling that he did not study or care enough is also left with little else but guilt as a repercussion or indifference as a protection. Specific explanations of skill deficiencies followed by cooperative planning of steps to overcome or circumvent those difficulties are essential. Students should be responsible but their responsibility should be based on detailed knowledge, not general assumptions.

Emphasis is currently being placed on training students to attribute their failures and successes to factors which they can control (Tollefson, et al., 1982; Borkowski, et al., 1986). Asking students to question their task performances according to statements which help them to understand the place of effort in work is commendable. For example, Tollefson et al. (1982) had learning disabled adolescents question their performance on a spelling test by asking the following question:

> When I do not spell words on the spelling test correctly, it is because:
> a) I am not good at spelling
> b) I was unlucky (I wasn't asked any of the words that I could spell)
> c) The spelling words were too hard
> d) I did not try hard enough to spell the words correctly. (p.16)

Attempts to link causal attributes with strategic behaviours are an integral part of the Borkowski et al. (1986) metacognitive model in which students are asked not only to apply a strategy but to evaluate their performance and to attribute the effectiveness of their behaviour to a specific factor.

It may be seen to be useful in future to expand these lists of criteria or to leave an open-ended component in these exercises. Attribution factors might legitimately include statements relating to skill levels or second party influence such as "I could not read the question", or "The test was based on material not covered in class or in the text." Students need to know how to develop strategies for a range of situations so that they may exert control on their environment to effect positive change. When legitimate effort has not been enough, students need to evaluate why this is the case and take steps to rectify the situation. For example, asking for a reading "buddy" to help with difficult material or approaching the teacher for guidance in material to use in preparing for an exam.

Teachers need to help students to make good critical judgements which may extend beyond the factors which have been included in attributional retraining studies to date or they may simply choose to define those factors more specifically. Further discussion of attributional theory may be found in the following section.

Implications for Further Study from Speculation Four

The present study was formulated with the intent of investigating the ways in which inefficient teenage learners organize or fail to organize conscious activities of differing kinds. As part of that investigation, both the study skills and academic achievement of the students were examined. Rohwer (1984) has said: "A review of the available literature on studying and—achievement reveals a virtual absence of systematic analyses of the components and prerequisites of successful academic performance" (p. 12). The same might be said of the specific nature of unsuccessful academic performance. Any attempt to answer the complex question of why children fail must take into account many factors. The essential ingredients may be said to be the learner, the task and the teacher but within each of those three components there exist a large number of variables which interact with one another and with variables from other components. The need to analyze and carefully describe each component should be recognized and addressed in future research. The complexity of such a research thrust is recognized. What follows is meant only to suggest some approaches to dealing with a few of the considerations of the larger investigation.

Learner

Included in the present study was an attempt to describe the subjects in a fairly detailed manner. Ability, achievement and feelings were all investigated. Both the Questionnaire on Organizational Skills and the Interview Regarding Study Habits yielded valuable information regarding how pupils approached schoolwork and how they felt about themselves and their work. It is the writer's desire to refine these instruments through future research.

Subsequent to the collection of data for the present study, a further literature review uncovered three other instruments with what appear on the surface to be somewhat similar intents. The Survey of Study Habits and Attitudes (SSHA) (Brown and Holtzman, 1967), the Inventory of Learning Processes (ILP) (Schmeck, Ribich and Ramanaiah, 1977) and the Study Process Questionnaire (Biggs, 1978) are the three surveys in question. A careful investigation of the structure, validity and reliability of these instruments will be undertaken before final revision of the Questionnaire and Interview, developed for the purposes of the present study, are again field tested.

Rohwer (1984) has cautioned:

> To date, then, survey self-report investigations of the relationship between study activities and achievement exhibit both potential usefulness and severe limitations. The limitations consist of a lack of specificity in the measurement of particular activities and in the aggregation of these self-reported activities and achievement across course characteristics. (p.4)

Task

The differences in the performance of pupils from academic to less academic subjects, as well as teacher perception of organizational ability of subjects in those differing school settings, was very clear in the present study. It remains to be seen through further investigation if these trends continue. However, the trends do support Rohwer's (1984) statement and what is a generally held belief--that people approach different tasks differently. One of the questions to ask must be: "How different must the task be before it is approached differently?". There are many possibilities for research into the parameters of specific and transsituational strategies from task to task when the exact nature of each task is carefully noted. One such question might be: "When does a transsituational strategy reflect efficiency and when does it denote rigidity?".

Teacher

Kane (1984), in describing cognitive styles of thinking and learning, stresses that it is not so much the learner's particular style but the capability to flexibly move into another style which leads to successful learning. It is Kane's belief that rigidity of style, when it occurs in the pupil, creates learning problems, but when the situation is compounded by rigidity on the part of the teacher as well, and when the pupil and teacher possess different styles, the results are disastrous for the pupil. In an attempt to avert such ineffective interaction, Kane (1984) outlines student learning characteristics and appropriate teaching strategies. While Kane's attempt to lock all learners into one or the other of two learning styles may be a bit simplistic, the basic tenet of his argument appears to be sound.

Flexible Thought

In the discussion of Speculation Three, the importance of using techniques of discovery learning as well as direct teaching of strategy has been suggested. For pupils who display rigidity of approach or who simply refuse to enter into an experiment because they feel they already know what to do (as occurred in the Rods Task with Subjects D and G), some formal attempt to increase flexibility of thinking may be necessary prior to implementing less direct teaching approaches in general.

de Bono (1986) supports the position of setting aside part of the day for the teaching of thinking skills. He stresses that "we need thinking that is generative, constructive, and organizing as well as critical. And error-free or logical thinking is not necessarily good thinking: the logic system can only be as good as our original perceptions" (de Bono, 1986, p. 16). de Bono (1986) recommends a particular packaged approach called the CoRT (Cognitive Research Trust) Program. He does not, as many researchers and educators do, limit his view by suggesting CoRT for the gifted, achieving student only. In de Bono's (1986) words, "it often happens that pupils who are rather backward at other subjects suddenly shine as thinkers."

It is not the intent of the writer to advocate any one particular program; however, the concept of openness to learning, flexibility of thought, and efficiency of thought must surely be part of strategy choice and strategy use. Additional research which examines the effectiveness of various approaches to helping strategy-deficient, inefficient learners become strategy-rich, efficient learners should be continued both by building on the foundational work of researchers such as Alley and Deshler (1979); Feuerstein (1979, 1980); Stone (1980); and Brown and Palincsar (1982); Deshler and Schumaker (1986); Palincsar (1986); and by striking out in new and equally fruitful directions.

Achievement Responsibility

Other perspectives from which to view the subjects' tendencies to look inward for their failure are to be found in the locus-of-control and attributional theory literature. The contributions of each of these fields of research to a fuller understanding of the six subjects of the present study must be made guardedly because in the present study no in-depth analysis of the data was made while adhering to the principles espoused by the respective theories. For example, no formal measures of locus of control or of achievement attribution were taken in the present study. In order to establish a label of internal or external locus of control or to determine the factors to which an individual attributes success or failure, responses on a valid measure of those skills should be considered. It is recognized, however, that the transcripts from the present study are rich in relevant data, much of which could be further analyzed in light of locus-of-control and attributional theory principles. Without further analysis, only the most general comparisons can be made of the subjects' statements of attribution (of personal failure and the success of others) to the major findings of the two research thrusts. Any attempt to equate descriptors would be suspect. For example, there is no assurance that "internalized" as described under the parameters of the present analysis can be equated with a descriptor of internal locus of control or internal attribution factors as defined operationally in other research.

Academic locus of control reflects the manner in which individuals perceive the relationship between their academic behaviours and performance outcomes (Phares, 1976). According to Lefcourt (1976) those with an internal locus of control perceive events as the consequence of their actions and therefore potentially under their personal control, while those with external locus of control perceive events as being unrelated to self behaviour and therefore beyond personal control. Research indicates that learning disabled students indicate more orientation toward external locus of control than do their normally achieving peers (Hallahan, Gajar, Cohen and Taver, 1978; Marsh, Gearheart and Gearheart, 1978; Chapman and Boersma, 1980). As the above statement would indicate, however, not all learning disabled adolescents are found to exhibit external locus-of-control characteristics. For example, Bendell, Tollefson and Fine (1980) found a wide enough range of locus-of-control orientation in 97 learning disabled adolescent boys to select two divergent groups of 25 subjects each.

Just as the literature reveals a greater proportion of learning disabled subjects as possessing external locus of control, attribution theory studies report a tendency for learning disabled students to attribute their failure to uncontrollable facts such as lack of ability, task difficulty or teacher bias (Dweck, 1975; Cullen, 1985). According to Bar-Tal (1978), "an attribution is the inference that an observer makes about the causes of behaviour, either his own or another person's" (p. 278). In keeping with the work of others (Dweck, 1973; Cullen, 1985; Tollefson, et al. 1982) found that learning disabled adolescents attributed failure to a personal characteristic which they could not change (i.e., ability) and did not accept responsibility for their successes. There was a discrepancy, however, in how the subjects explained their successes and failures on a general attribution measure, The Intellectual Achievement Responsibility Questionnaire (Crandall, Katkovsky and Crandall, 1965), and a task specific measure--a spelling test.

The questions posed in the present study gave the subjects the opportunity to comment only upon their own problems in school and the successes of others in academic endeavours. They were not asked to account for their successes or the failures of others. Given that there are usually four elements considered in attributional studies--namely, reasons for personal success and failure as well as reasons for the success and failure of others, opportunities of direct comparison of the data, as it has been analyzed, with the existing literature is limited. Because of the use of open-ended questioning it is likely that transcripts will, upon further examination, continue to yield attributional information. On a general level, however, it is clear that the subjects participating in the current research did not, as many learning disabled students may do, attribute their failures to ability. However, since subjects were told when they were first asked to participate in the study that they had been chosen because they had good intellectual ability and since that information was repeated to them just prior to the posing of the question regarding their school problems, it is less likely that they would have referred to themselves as being of lower ability than if information about their ability had not been shared with them.

Further research which considers a number of factors including: 1) a thorough knowledge of what skills the subject bring to the task; 2) accepted formal measures of locus of control and attribution of achievement; 3) open-ended metacognitive interviews; and 4) observed task performance, might compare the use of general attributional retraining with a more individually specific attributional retraining composed of a greater number of factors.

SPECULATION FIVE

Students who are racially or culturally different may feel less comfortable talking about their school problems than those in the main cultural stream or they may simply verbalize less.

Discussion

Subject A, a British-born black who had spent his early school years in England and who had received his later education in the Caribbean, was accepted in the study originally, despite the exclusionary stipulations of the screening process, because he was English-speaking and from a relatively high socioeconomic stratum. It was not believed during the preliminary stages of the study that his not being born in Canada would set him apart in any significant way from the other subjects.

Subject F, on the other hand, was chosen to take part in the study precisely because of his minority status. Although Subject F's native ancestry had to be traced back to a grandmother, he identified far more with the Indian culture than with the mainstream white culture. His poems, an example of which is to be found in his case study (Chapter VI of the present study), reflect his strong ties to his native heritage.

In examining the verbal protocols from the Questionnaire on Organizational Skills, two interesting patterns are evident regarding the verbalizations of Subjects A and F as compared to the other subjects. These two subjects offered considerably lower proportions of spontaneous examples when they responded to the questions. They both tended to either simply agree with, or disagree with, or parrot the examiner's words rather than to make a comment. Neither subject elaborated on his terse replies. In short, these two subjects said less and used the shortest possible route to say what they did say.

Subject A at times seemed almost fearful about responding to queries and obviously desperately wanted to say the "right" thing when he did reply. There was little question that he would change his opinion to please the examiner. It was not long after the data collection was complete that Subject A's mother revealed information to his learning assistance teacher about a very difficult period during his school career in which physical punishment was used by one of his teachers when incorrect answers were given in class. This reason, in and of itself, may well have contributed to Subject A's reticence.

Results of formal language assessments did not, in themselves, give a conclusive explanation of this sparse language production. Of the six language measures taken in the present study, Subject A ranked lowest on one and second from the bottom on another. Those two scores were quite markedly below the mean, while all his other language scores were at or above the mean. Subject F ranked the lowest on three of six language measures but higher on the three remaining measures, including a ranking of second highest on Producing Formulated Sentences on the CELF.

Subject F "protected himself" during his interactions with the examiner. He had behaved in a socially inappropriate manner and when his behavior was identified he became less open. It must be stressed that Subject F was not reprimanded, so any reaction was the result of his feelings regarding his own behavior rather than these being any guilt imposed on him by the examiner. However, it is significant in itself that Subject F engaged in the behaviour at all. A young man of his age would have been expected to monitor his actions in a much more controlled fashion.

In addition to his cultural difference, Subject F lived in poverty and in all probability had little experiential base to act as a foundation for further learning. The manner in which he had taken the writings of Tolkien into his life experience was, however, of great interest. With these works he exhibited no reading difficulty or at least he stuck with the text, reading the books over and over until he knew the events of each of them in great detail.

Both Subject A and Subject F had good relationships with their resource room teachers. Subject F's English teacher had also taken a special and supportive interest in him. Yet there was no question that both these young men were different. They tended to be loners and were not open to talking about their feelings with others. Subject F, however, did have an outlet in his poetry and an escape in Tolkien, which were vehicles not available to Subject A, who seemed to have little control over any aspect of his life.

While no sociograms were completed, Subjects A and F seemed to be more isolate than the other five subjects. They would be unlikely to fit with ease into any of the more usual social groupings to be found in the typical high school setting.

It was clear that in Subject F's case he had been streamed quite successfully into adapted classes and was maintaining a respectable average in those classes. Yet he verbalized, with a tinge of bitterness, that "they" could never make up "their" minds about whether he should be in regular or adapted classes and that he had been put back and forth from stream to stream more than he would like. Despite his criticisms, Subject F liked school well enough to stay beyond the age where he could have legally discontinued and had an excellent attendance record. It should be added that he was first referred for special assessment and help in the first grade and thus had a history of being supported throughout his school career.

Subject A, on the other hand, seemed more like a leaf buffeted by the winds with no real definition of himself or his needs. He reacted to please others and seemed motivated by fear and shyness more than any other forces. A student in a new school in a new country, he had had little time to establish himself when the present study first began. Seven months later, when the Questionnaire and Interview were completed, he had matured physically and grown somewhat in confidence, but many of the same characteristics remained.

In presenting this review on the relatively sparse language production of Subjects A and F, an attempt has been made to bring out a number of factors which may have contributed to their terse responses. Cultural difference forms the focal part of the discussion but, since there can be no determination of the weightings of the factor discussed, other aspects which have been presented should not be ignored.

Educational Implications

The issue of cultural differences in school is one that is addressed in almost every overview textbook on exceptional children (Cartwright et al., 1984; Morsink, 1984; Schwartz, 1984; Ysseldyke and Algozzine, 1984). It is clear that for many children the culture encountered in the classroom differs from the culture found within the home. Westby and Rouse (1985) cite Hall (1976), who has said:

> Education is deeply rooted in culture. In the United States, whites are most typically brought up with some version of the northern European

> tradition. This makes problems for everyone else, because education, like the missionaries of the past, practise an unconscious form of cultural imperialism which they impose indiscriminately on others . . . I refer not so much to content as to how learning is organized, how it is presented, its setting, the language used, and the people who teach it, the rules by which they play as well as the institutions themselves. (p. 205)

Since it is not likely that the presently acceptable way of administering high schools will change within the near future, it seems imperative that the culturally different student find an ally of sorts in the school. For both Subject A and Subject F one of those allies was the learning assistance or resource teacher. Both subjects relied on that staff member as someone with whom they could discuss problems and share feelings. The existence of such a person, on whom culturally different students could call, could tend to "soften the system" for them. Such an advocate could also serve as a mediator between the student and a teacher whose approach was making learning particularly hard for the pupil. In essence, such a step would be turning one of the traditional roles of the resource teacher, that of helping the regular classroom teacher to plan for special needs students, into a model for assisting culturally different students in their adjustments to the milieu of the classroom.

Implications for Further Study from Speculation Five

Studies in which the verbalizations and actions of teachers are observed and recorded would permit researchers to compare teachers' presentations with the needs of their pupils. Objective evidence could be presented to teachers who wished to attempt to alter teaching methodologies which seemed to be ineffective.

Harris (1985), in discussing North American Indian children, has cited the work of Labov (1976) to emphasize that:

> . . . children who spoke in truncated utterances in school or during interviews with strangers were highly effective and creative communicators in culturally realistic settings and when interacting verbally with their peers. (p. 44)

The child as speaker could be observed in a range of different settings to see if the nature of the individual's speech varied or remained constant. Harris (1985) has said that there are dangers in basing a professional judgment regarding the individual's language skills on the basis of standardized tests alone. In Harris' view professionals may rely too heavily on test results or conversely dismiss the results because of known flaws in the tests.

Of interest would be further documentation of the effects of supportive, rather than threatening, learning environments on the language and behaviour of culturally deprived students. In the present study, both Subjects A and F had found understanding teachers who made their school experiences more pleasant. In Subject F's case, long-term special services and alternate programs had contributed to his still being in school. A series of single-case studies which pursued the situational contexts in which the individual communicates and functions most naturally and effectively would be of value.

FURTHER CONTRIBUTIONS

Methodology

The present study has, in applying the data reduction and data analysis techniques of Giorgi (1975) to the extensive verbal protocols of the subjects, added a new dimension to the study of metacognition in the learning disabled. This uniqueness was present both in the methodology itself and the information gleaned from utilization of the methodology. The open-ended questions and the discussions that those questions provoked yielded spontaneous verbalizations which were frequently almost conversational in nature. This willingness to disclose to the examiner was the result of another positive and fairly rare element of the present research. Subjects had spent several hours over a number of days with the examiner before they were questioned regarding their organization skills and study habits. The voluntary aspect of their involvement in the study plus the number of preceding sessions, in all likelihood made most of the subjects feel relaxed about their participation in the interviews. It was in the resultant verbalizations, methodically reduced and systematically analyzed, that a rich storehouse of information regarding students' knowledge of how they learned, as well as their knowledge of how they regulated their learnings, was found.

In relating this information to some of the principal findings of the study, it might be said that subjects, who did not appear to utilize their knowledge to regulate their behaviour, did not tend to spontaneously incorporate statements of regulation into their responses to general open-ended questioning about their study habits (Interview Regarding Study Habits), nor did they respond positively to very specific questions regarding their ability to regulate their studies (Questionnaire on Organizational Skills).

The present study also offered the opportunity to compare what subjects described as their understandings of a concept with actual application of that concept to a task. Future research, which would incorporate classroom observation over time into the present framework, would add another interesting perspective to what has been initiated in the present investigation. Such an approach would extent understanding of the relationship between what adolescents with organizational difficulty know about their learning and how they use that knowledge to regulate their behaviours.

Questionnaire

While not plentiful, structured questionnaires on study skills exist and have been referred to elsewhere in this chapter. What sets the Questionnaire on Organizational Skills, developed for the present study, apart is the theoretical construct on which it has been based. The similarity between the organizing and regulating functions of the frontal lobes on behaviour, and metacognitive skills has been recognized (Brown and Palincsar, 1982). Through the Questionnaire on Organizational Skills, an attempt was made to clarify organizational difficulty by developing questions based on the steps involved in an organized act (Luria, 1973b); functions subserved by the frontal lobes.

A study using only seven subjects precludes making any conclusions regarding the validity of the Questionnaire in measuring the six components of which it is comprised, however, the use of this instrument made substantial contributions to the trends observed in the present study. It was interesting to note, for instance, that five of the subjects received equal or similar rankings to one another when their ranked performances on the Self-Ordered Task (sensitive to frontal lobe dysfunction) were compared to rankings of how their teachers had rated them on the Questionnaire on Organizational Skills. For this small group, there was a common trend in the way these two instruments ranked the subjects.

Rankings were also equal or similar for five of the seven subjects when they were ranked on their Performance IQs and teacher ratings on the Questionnaire, as well as when they were ranked according to their lowest academic standings and teacher ratings on the Questionnaire.

Analysis of responses to the Questionnaire on Organizational Skills also resulted in some rather interesting comparisons of how the subjects viewed themselves when commenting on their own general and specific organizational skills. These trends became more intriguing as students' opinions were compared to the responses of their teachers when those instructors commented on their students' abilities on the same skills. The further step of comparing the opinions of teachers from academic and less academic settings to one another and then again to how students viewed themselves, yielded information which has profound implications for the classroom.

Specific trends may be reviewed by reading the relevant sections Chapter V of the present study.

CONCLUDING REMARKS

Application of qualitative data reduction and data analysis techniques to the verbal protocols of the students studied in the present investigation was a most worthwhile and valuable endeavour. From such techniques it was possible to distinguish patterns and trends which would not have been revealed through other approaches. Tabular representations, resulting from the procedures implemented, frequently allowed the researcher to confirm or refute clinician hunches which were formed as she interacted with the subjects. Such an approach also permitted comparisons of students' strategies and opinions across a range of tasks. As well, it was a means of examining the process of doing a task, not just of viewing the outcome of the task.

An example of the effectiveness of the methodology utilized in the present study can be found in the way it permitted the researcher to go beyond the surface level opinions voiced in the Interview Regarding Study Habits. The themes and transcripts from the Interview were examined for statements which reflected: general knowledge of the subjects' approaches to school work, specific knowledge of their study habits, and knowledge of how they regulated their study skills. By carefully evaluating the verbalizations of the subjects and categorizing them into one of the three classifications just mentioned, it was found that five of the seven subjects used fewer regulatory statements than either of the two categories of "knowledge of" statements. While for two of the subjects this information was not conclusive in terms of the supporting documented trends in the present study, results of the data added to the very clear patterns of problems in regulation already established on the Rods and Text Search Tasks, as well as in the Questionnaire, for Subjects A, D and G. In the cases of Subjects E and F, there was not such a strong objective pattern, but the data was still supportive of the picture of the inefficiency which had been reflected in their schoolwork throughout the years. In terms of overall outcome, it appears that the majority of the subjects studied had little idea of how to regulate their study habits. While the surface data may have drawn the researcher to a similar conclusion, the data reduction, and data analysis, along with the minimal quantification, gave a much stronger and objective picture.

If there is to be a future refinement of the implementation of the methodology as it was used here to pull patterns from the data, it might be that it may be utilized more effectively with fewer subjects and/or tasks at one time. The enormity of the data gathered in the present study prevented the researcher from pursuing all the trends, or even from reporting all the patterns, which were uncovered. There is still much information to be gained by following other trends through the data across tasks and subjects. As well, further pursuit of the patterns within the data gathered on each subject may add to the information on transsituational strategies which has already been gleaned.

Murray, Anderson, Bersani and Mesaros (1986) in their article advocating the use of qualitative research designs in special education have said: "Because qualitative methodologies focus less on individual deviation-from-the-norm and more on the individual's interaction with contextual factors . . . qualitative methods offer means to obtain data different from that obtained by traditional quantitative studies" (p.17). In-depth investigations which pursue the nature of inefficient learning and the qualities of effective teaching are most important if educators are to reverse the trend of frustration and alienation which marks the school experiences of many learning disabled individuals. Although recent years have seen an increasing emphasis on improved special education services at the secondary level, many L D adolescents are receiving inappropriate programming or, as Zigmond and Thornton (1985) report, are leaving the education system as drop-outs. It is long past the time where research in education should have moved away from attempting to prove, once again, that learning disabled children and adolescents do less well than their achieving peers on a range of tasks.

Learning is an interactive process which lends itself to the techniques of qualitative research. Murray at al. (1986) have said of the naturalistic observation strategies that they "yield data which is high in ecological and social validity, data highly relevant to the development of effective intervention for integrated settings." Qualitative research results can give a perspective which may never be gained through more traditional approaches. Interviews, for example, allow the release of one of the most devalued aspects of the assessment procedure--the opinion of the individuals experiencing the problem. Those opinions are rich not only in what they yield in immediate information, but in what they hold as data when they are carefully examined for more than is at first apparent. Patterns discovered in this manner can then be compared with other patterns drawn from the interactions of students, teachers and tasks yielding a far more in-depth view of the child as learner--efficient or inefficient.

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Appendix A

LETTER OF PERMISSION

May 12, 1983

Dear

With the approval of the ________________ School Board and the University of Alberta, I am conducting some research at______________ School. I would be pleased if your son, could participate in my study. I have explained the research to and he expressed a willingness to be involved. was selected because he has good intellectual ability and because he has experienced some academic difficulty in the past.

The study is made up of four nonacademic tasks which are designed to study differences in the ways high school students organize themselves as they work. In order to gain backgound information, an ~~intellectual~~ assessment and some achievement testing should also be done. While results of these tests will be placed in file, they are primarily for use in the study. However, I would be happy to discuss the results of any of these tests with you.

In accordance with regulations, I need your approval in order to complete the IQ testing required. Would you please fill out and return the attached form as soon as possible, indicating whether I have your permission to do the assessment. If I have not heard from you by __________, I will assume that you are in agreement for the testing to be done.

Yours truly,

G. Robertson

I hereby give my permission for my son ________________to be given an intellectual assessment.

Date ______________________ ______________________________
Signature

Note: The last line of the letter was removed for the Saskatoon subjects at the request of the Catholic School Board.

Appendix B

QUESTIONNAIRE--TEACHER VERSION

Thank you for agreeing to complete the accompanying questionnaire. The purpose of the questions you have been given is to elicit teacher opinion on an individual student's organizational ability rather than his or her academic ability. If you find yourself responding to a question by thinking that your opinion might vary depending on the situation, please list the settings which you are considering and make more than one rating. For example:

	A	U	S	N	DK
3. inspects work as s/he goes along ___					
shop		X			
written work			X		

In such cases, please make the X with care so that the column can be easily determined.

Please read the General Instructions carefully before you begin. Remember to consider the student's behaviour over the semester so that you are reporting on his or her characteristics and not isolated reactions to specific situations.

QUESTIONNAIRE

General Instructions

Your response as you fill out this questionnaire should be based on the behaviors and work habits of ____________________. Section A may be answered by placing an X in the appropriate box while Section B may be completed by filling in the blank and by adding any further descriptors regarding this student's organizational abilities or disabilities.

In completing Section A, you may find certain of the questions to be similar. For the most part, these similar items do contain subtle differences or they may approach a trait from slightly different perspectives. In other cases, the questions serve to substantiate the persistence of a certain characteristic.

This questionnaire is intended to reflect the student's general ongoing habits rather than to serve as as checklist of behavior for one observational period.

Section A:

Beside each of the following descriptors below, please indicate if you see the behavior ALWAYS (A), USUALLY (U), SOMETIMES (S), NEVER (N), or if you DON'T KNOW (DK) how the statement applies to this student's behavior.

		A	U	S	N	DK
1.	is on time	___	___	___	___	___
2	knows what to do after initial instruction	___	___	___	___	___
3.	inspects work as s/he goes along	___	___	___	___	___
4.	begins task immediately	___	___	___	___	___
5.	compares the results of work with intent of assignment	___	___	___	___	___
6.	makes identified corrections independently	___	___	___	___	___
7.	is tidy about personal belongings	___	___	___	___	___

8. integrates earlier aspects of a task by checking back as s/he works ___ ___ ___ ___ ___

9. seems to have a plan for an assignment ___ ___ ___ ___ ___

10. works out alternative solutions to problems ___ ___ ___ ___ ___

11. checks for errors when finished an assignment ___ ___ ___ ___ ___

12. edits or rewrites original draft work ___ ___ ___ ___ ___

13. has at hand the necessary materials for which s/he is responsible (i.e. pen, eraser, notebook, etc.) ___ ___ ___ ___ ___

14. appears directed ___ ___ ___ ___ ___

15. sees errors as s/he works through an assignment ___ ___ ___ ___ ___

16. tends to make corrections as s/he works ___ ___ ___ ___ ___

17. proofreads written assignments ___ ___ ___ ___ ___

18. tends to hand in polished product ___ ___ ___ ___ ___

19. sets priorities when completing a series of tasks ___ ___ ___ ___ ___

20. carries through to the end of an assignment unless a legitimate problem is encountered ___ ___ ___ ___ ___

Section B:

Answer question 21 by filling in the appropriate word. Use the remaining spaces to write any additional description of this student which you feel is relevant to his or her organizational skills.

21. Generally, I would describe this student as ____________________ (ORGANIZED or DISORGANIZED)

22. Written comments:

Please indicate the subject area in which you instruct this student.

____

Appendix C

RODS TASK ARRAY AND STAND

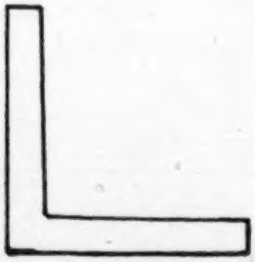
These arrays include 2 rods with wooden bases labelled W.

Demo rods = 60-3-W.40-3-W

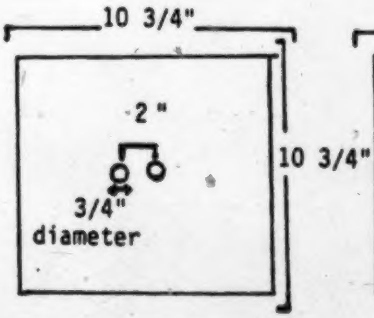
Rod array #1	Rod array #2
20-4-P(i.e. 20 cm. long. 4/16 in dia. plastic rod)	40-2-P
40-2-S	60-2-S
60-2-W	20-2-P-W
40-4-P	60-3-W
40-2-W-W	20-2-P
20-3-S	40-2-S
40-2-W	20-3-W
20-3-P	40-2-P
40-2-P	60-4-S
20-3-P-W	60-3-W
60-2-W	20-3-P
40-2-P	40-2-S-W

Each rod is embedded in a standard 3/4 inch base which is 1 and 1/2 inches long.

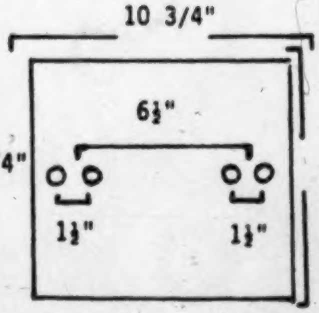
SIDE VIEW



FREE PERFORMANCE VIEW



PAIR CHOICE



Appendix D

RODS TASK DESCRIPTION

DESCRIPTION:

A. BENDING RODS TASK:

1. Materials.

Materials for the rods tasks consisted of 26 rods (two sets of 12 rods each and one additional pair of rods used during the initial task instructions). 2 pairs of weights to attach to the rods, and a stand into which the rods could be inserted.

The rods were selected to vary along five dimensions (i.e. variables) with two or three levels of each dimension length (20, 40, and 60 cm), diameter (.32, 0.28, and 0.64 cm), material (plastic, wood and steel), *base (black plastic or metal). Amount of weight (1 or 2 oz.) also varied. They were identical on all other possible dimensions.

The two sets of rods differed only in terms of the particular combinations of levels of the five dimemsions represented. In both sets each level of each dimension occurred at least once. Also, in each set there were the same number of possible unconfounded tests of each variable and approximately the same number of possible confounded tests. Thus, the two sets did not differ appreciably in the probability with which a subject could select at random a pair of rods which would constitute an unconfounded test of any given variable.

2. Subtask Sequence:

All subjects were given the following sequence of subtasks in the same order: Free Performance 1, Pair Choice, Free Performance 2, and Final Choice.

3. Free Performance Task

The subject was presented with a set of 12 rods, the four weights and the stand. The pair of demonstration rods, which constituted an unconfounded test for length, was used to demonstrate that some rods bend more than others. The subject was then asked to figure out, by comparing pairs of rods, what makes some rods bend more than others and to explain why s/he had chosen each pair of rods and what s/he had learned after each test. Follow-up questions were used as needed to clarify the subject's choice of rods. After the subject indicated that he was finished testing rods on his own, the experimenter asked for a summary of conclusions about bending. If fewer than five dimensions were mentioned by the subject, he was told that some other things matter for bending and asked what they might be. Any dimensions not identified by the subject spontaneously or in response to this question was then named by the experimenter and the subject was asked to show how that dimension influences bending. Further tests of the effect of some of the dimensions were then requested by the examiner, if the subject prior to the summary had not made consistently confounded or unconfounded tests of that dimension.

4. Pair-Choice Task:

The subject was presented sequentially with five sets of two pairs of rods each. Each set offered both a confounded and an unconfounded test for one of the five variables. Here not only were the rods preselected and the variable to be tested specified, but also the comparison of two pairs was likely to call attention to the confounded variable. For each pair-set the subject was asked, "Which pair do you think is better for finding out if ______________ matters?" "Why is that pair better?" The subject was asked to respond without using the weights except for the test of weight, when the experimenter placed the weights on the rods.

5. Final-Choice Task:

The subject was presented sequentially with six pairs of rods (only one of which constituted an unconfounded test of a variable). For each pair, the subject was asked, "Could you use these rods to tell for sure whether ____________________ makes a difference?" "Why or why not?"

*Note: In the present study, plastic or wooden bases were used. As well, a final independent test, in which the subject was asked to demonstrate a good test of a variable of his own choice, was incorporated.

Appendix E

METACOGNITIVE ASPECTS OF RODS TASK

Subject A

S: I learned something. That ah - you can find out how much a thing can bend by the substance or thickness or length.

Comment: Here the subject tended to repeat some of the things he had just mentioned in his response to summing up the things which mattered for bending. He showed no attempt to compare his initial response.

Subject B:

S: Well - I thought that the wood would bend more than the plexiglass - depend - well - I didn't - I was - I thought the wood would bend more than the plexiglass - no matter what the thickness of it was, but the plexiglass is more - it's made to bend - without breaking while the wood if you bend it quite a bit it'll just crack - it's just . .

Comment: Subject B tended to concentrate on one comparative test of material.

Subject C:

S: Yeah, it surprised me quite a bit that the brass was as strong as it was - I didn't - I thought it was weak - um - very bendable one and comparing it with the metal it seemed to be the same strength - which surprised me a lot - and I thought that the wood was stronger than it really was - I always thought it was a lot stronger.

Comment: Subject C discussed the strength of three materials.

Subject D:

S: I didn't really notice a change - but I did change my mind once or twice - or a couple of times - over there - oh.

Comment: Subject D had been offended by the suggestion that he experimented at all, since he was convinced that he knew all there was to know before he began. By the end of the session, he seemed to feel somewhat apologetic about his resistance during the task and this is reflected in his answers.

Subject E:

S: Yeah.

E: How?

S: just said the weights - the length, the width and there's a lot more.

Comment: This subject concentrated on the number of variables he had identified.

Subject F:

S: A little.

E: What?

S: That different materials - they're different - even though they're made out of th substance - that things will be different.

E: Tell me a little bit more about that - I don't quite understand.

S: Well - plastic - one could be thinner - and be different or you could have one that's steel and one that's plastic - the plastic one could be smaller but the steel will resist just as much.

E: So - could you kind of summarize what you've learned then? About these two things that you've just mentioned.

S: Ah - the plastic measures - and - all the things made - and what resistance it has - what's the capability of the resistance.

Comment: Subject F's responses were convoluted.

Subject G:

S: No.

E: K.

Comment: Subject G felt sure that he had learned nothing from the experiment.

Appendix F

SAMPLE QUESTIONS USED IN TEXT SEARCH TASK

TRIAL ONE

What does this text tell us about the bones of the arms and legs?

Demo 1	What does this text tell you about the body parts of insects?
Demo 2	What does this book say about the use of carbon dioxide by plants?

TRIAL TWO

What does this book tell you about the muscles used in breathing?

Appendix G

TEXT SEARCH TASK DIRECTIONS

Guidelines for Administration of the Demonstrations Used to Elicit Strategy:

1. Prior to each of the three demonstrations, a description of what is to take place in the demonstration will be read verbatim to the subject.

2. The main descriptors of the previous directive will be repeated again in conversational format during the demonstration.

3. Following the presentation of the basic instructions and during the demonstration, the examiner may repeat instructions upon the request of the subject, or when she notes that the subject does not understand the task or has forgotten important elements of the task.

4. The examiner should refrain from giving to a subject additional information which will change the nature of the task or make comparison of the results between subjects and between tasks difficult.

INTRODUCTION

Remember that I gave you a reading text to find out your level of reading? I used that information to choose a book which should be several grade levels easier than that level to be-sure that there would be no reading problems for you. The task which I am going to ask you to do in a few moments is more a matter of finding if a textbook would be a useful book to use in finding information on a particular topic than it will be a matter of doing much reading in the book. As I said, I don't think you will have any problems with the reading. Don't forget to tell me what you are doing and thinking as you work.

TRIAL ONE

General Instructions

Now, I would like you to take this text (examiner points to text) and show me how you would use it to find out if it contains information on (state topic in question). Again, show me how you would use this book (point to text) to find out if it contains information on (repeat topic). (Student is left to proceed using whatever procedure he wishes.)

DEMONSTRATION ONE

General Instructions - Initial

Now, I'm going to use the book. When I've finished, I'm going to ask you some questions about how I've used it. I will tell you what information I want to find in the text and then I will show you three different ways of using the text to find out if it contains that information. I want you to tell me which is the best of the three methods I use.

First Method

I want to see if I can use this book to find if it contains any information on (state topic). I'll open the book, flip through the pages and look at some of the pictures. I will be looking for pictures of (state topic) to see if I can find a section on (state topic).

Second Method

Here is my second method. Remember, I want to see if I can use this book to find (state topic). I will open the book, turn to the table of contents and see if the topic is listed, then I'll turn to the page listed and then flip through the pages of the chapter. As I turn the pages, I'll be looking for pictures and headings until I find if (state topic) is included. That is my second method. (Demonstrate, then repeat: That is my second method.)

Third Method

Here is my third method. Remember, I want to use this book to find if it contains information on (state topic). I will open the book to see if the book covers the topic (state topic). If I find a chapter on that general topic in the table of contents - then I'll turn to the back of the book to the index where I will look for (state topic). If it is I will then turn to the page on which the information is to be found. That is my third method. (Demonstrate, then repeat: That is my third method.)

General Instructions - Final

Tell me which is the best method of using the book to find information: the first, the second or the third. Also tell me why you think it was best.

DEMONSTRATION TWO

(This demonstration is identical to Demonstration One, with the exception that another topic is used.)

TRIAL TWO

General Instructions

Now I'm going to ask you to use the book again. Would you please take the text and show me how you would use it to find out if it contains information on (state topic). Once more, show me how you would use this book to find out if it contains information on (repeat topic). Remember to tell me what you are thinking and to tell me what you are doing as you work. (Student is left to proceed using whatever procedure s/he elects.)

METACOGNITION

(The student is asked four questions.)

1. What is a good way of using a text to see if it contains information on a topic in which you have an interest. Just pretend I have asked you to see if this text contains information on a topic. Tell me and show me what you would do.
2. Could you compare what you did when I asked you to see if this text had any information on (topic from Trial One) and what you did when I asked you if this text had any information on (topic from Trial Two)? Tell me what you did each time and if you think there was a difference in your two methods.
3. Which do you think was your better method? Why? (If the subject has used the same method for both Trials, say: "What do you think of the method you used? Is it a good one? Why or why not?)
4. Did you learn anything today about using a text?

Appendix H

ERRAND PLANNING TASK--ELICITATION PHASE AND METACOGNITIVE QUESTIONS

ELICITATION PHASE

Each demonstration is preceded by the questions: "Which would be the best?" and "Why would that way be the best?"

Demonstration A:

Leave school at 1:30 and take the bus to the dentist. Walk home by way of the grocery store to get a bag of potato chips.

OR

Leave school at 1:30 on your bike. Pick up the potato chips at the Cafe. Buy your record at Franks. Drop your bicycle at the shop and walk home.

Demonstration B:

Take bus home at 1:30 and study for an hour. Go to the Shopping Center at 3:15 and buy your record. Meet Joe for a hamburger at the Drive-In at 3:45. Go to the dentist.

OR

Take bus home at 1:30 and study for an hour. Walk to your grandparents and then to the Department Store for your record. Go to the dentist.

Demonstration C:

Walk to the library at 1:30 and take back your book. Walk to the Shopping Center and get your record and chips. Bring them home to bring with you when you go to the party.

OR

Walk to the library at 1:30 with your book. Take the bus back to the Cafe and get your chips. Deliver the chips to the house where the party will be right away to be sure that they will be there for the party.

METACOGNITIVE QUESTIONS

1. Could you compare what you did in your first plan with what you did in the last plan. Tell me if you think there was a difference. Which do you think was the better method? Why do you think it was the better?
2. What makes a good plan? What would a poor plan be?
3. Did you learn anything about planning today?
4. What do you think about the planning which you did today? Did you make a good plan? Why or why not?

Appendix I

SELF-ORDERED TASK DIRECTIONS

Preliminary

All three trials of Set 6 are placed in front of the subject. He is shown that all the designs appear on all the pages but that they are not in the same order. He is also shown the blank sheets separating the trials.

> The instructor then says:
>
> You are to touch all the pictures but you just touch one picture on each page.
>
> You can touch the pictures in any order you wish but don't touch any pictures more than once.
>
> Accuracy, not speed is important. Work at a comfortable pace. I will time you to see that you don't go too slowly or too quickly. If you go too slowly, you may forget what you have touched. If you go too quickly you won't have time to look at the pictures. Stop when you come to a blank sheet. Begin.

When the subject arrives at the first blank sheet, the examiner says:

> Start all over. Don't touch any picture more than once. You can touch them in any order. Stop when you come to a blank sheet. Begin.

Note: Each trial is carefully timed.

Instructions for Trials Two and Three (At the beginning of each trial and when the subjects come to a blank page).

Now--start all over. Don't touch any picture more than once. You can touch them in any order. Stop when you come to a blank sheet. BEGIN. (Timing commences here and ceases when the student reaches the next blank page).

Appendix J

INTERVIEW REGARDING STUDY HABITS

Purpose: To elicit information regarding the subject's knowledge and feeling regarding his ability and his study habits.

1. Remember that I told you that I chose you to take part in my study because you were bright but that you had had some difficulty in school.

   What did you think when I told you that?
2. Has anyone ever told you before that you had good intelligence or that you were bright?

   a) If yes: Who? When?

   b) If no: How do you feel about learning that you have good intelligence?

   .. But you have had problems in learning ..
3. Why do you think you have had those difficulties?
4. Were some subjects harder than others?

   a) If yes: Which ones were the hardest? Why?

   b) If no: Why do you think that you found school so hard?
5. Why do some people do well in school?
6. What do you do when you are left pretty well on your own to do an assignment - something like writing an essay? Explain to me what you would do.
7. If you need to know a certain piece of information - for a paper you are writing, for example, how would you go about finding it?
8. Just suppose that your teacher has asked you to read a chapter in

a textbook, describe what you would do.

9. Suppose you have an exam tomorrow. Tell me what you would do to prepare for it.

Appendix K

QUESTIONNAIRE--STUDENT VERSION

Note: Questions parallel the Questionnaire--Teacher Version found in Appendix B

1. Are you on time in class?
2. Do you know what to do in class after the teacher gives you an assignment?
3. Do you inspect your work as you go along?
4. Do you start your assignment as soon as your teacher finishes instructions?
5. Do you think about whether you have done what the teacher asked you to do once you have finished an assignment?
6. Do you make corections without your teacher's help?
7. Do you think you are tidy about your personal belongings?
8. Do you check back to earlier parts of an assignemnt as you work?
9. Do you set out a plan for how you will do an assignment?
10. Do you work out more than one solution to a problem?
11. Do you check for errors when you finish an assignment?
12. Do you edit or rewrite original draft work?
13. Do you have pens, erasers, notebooks, etc., on hand?
14. Do you feel as though you had a direction when you are working?
15. Do you see your errors as you work through an assignment?
16. Do you tend to make corrections as you work?
17. Do you proofread your written assignments?
18. Do you hand in what you might call a polished product?
19. Do you set priorities when you have to finish a number of assignments or tasks?
20. Do you usually carry through to the end of an assignment?

21. Would you describe yourself as organized or disorganized?

Probe to determine what the individual does if he does not spontaneously elaborate on his response.

Appendix L

SUMMARY OF METACOGNITIVE QUESTIONING USED IN TASKS

Rods Task

The examiner moved her hand along the array and said?

1. "Choose a pair of rods which will be a good example of showing that one thing matters for bending - anything you wish."

   If the subject hesitated, she said:

   "Decide on something which matters for bending (pause). Then select a pair of rods and hang weights on them to show that they are a good test of that thing."

2. "Tell me all the things which matter (make a difference) for bending."

3. Do you think you learned some things about bending?"

   "Do you think your opinion changed from when you first were asked what mattered for bending to what you have just told me?

Text Search Task

1. "What is a good way of using a text to see if it contains information on a topic in which you have an interest. Just pretend I have asked you to see if this text contains information on a topic. Tell me what you would do?

   After the subject has completed his explanation, say "Show me what you would do.

2. "Could you compare what you did when I asked you to see if this

text had any information on (state topic from Trial One) and what you did when I asked you if this text had any information on (state topic from Trial Two)? Tell me what you did each time and if you think there was a difference in your two methods."

3. Which do you think was your better method? Why? (If the subject has used the same method for both Trials, say: "What do you think of the method you used? Is it a good one? Why or why not?
4. "Did you learn anything today about using a text?

Errand Planning Task

1. "Could you compare what you did in your first plan with what you did in the last plan. Tell me if you think there was a difference. Which do you think was the better method? Why do you think it was the better?"
2. "What makes a good plan? What would a poor plan be?"
3. "Did you learn anything about planning today?"
4. "What do you think about the planning which you did today? Did you make a good plan? Why or why not?"

Appendix M

ORGANIZATION OF CONSCIOUS BEHAVIOUR--METACOGNITIVE THEMES BY CATEGORY AND QUESTION

The following appendix lists metacognitive themes by category and question under each of the following headings:

1. General Organization.
2. Planning Skills,
3. Inspection Skills.
4. Regulation Skills.
5. Verification Skills.
6. Correction Skills.

These themes correspond to Step Five in the analysis of the Questionnaire on Organization Skills.

GENERAL ORGANIZATION

#1 - Are you on time for class?

A - On time.

B - Usually 10 or 15 min. late.

C - On time.

D - Basically on time.

E - Hard to be on time in AM.

F - Usually on time, sometimes late.

G - Except for first period in morning and after lunch.

#7 - Are you tidy about your personal belongings?

A - Yes, is tidy.

B - Average.

C - Tidy at school, not at home.

D - Sometimes.

E - Room and notes bad, phys. ed. equipment good.

F - Mostly tidy at both home and school unless bad day.

G - Room and locker messy, only valuables neat.

#13 - Do you have on hand the necessary materials for which you are responsible at school? (i.e., pen, eraser, notebook, etc.)

A - Has necessary materials on hand.

B - Usually.

C - Usually.

D - Necessary on hand but nothing extra.

E - Most of time, sometimes not.

F - Yeah.

G - Usually, trouble with pens.

PLANS

#2 - Do you know what to do in class after the teacher gives you an assignment?

A - Only sometimes knew.

B - Outlined what he would do. Building--draws. Starts to write immediately (English).

C - Outlined what he would do. Makes notes, gets book - makes notes, questions.

D - Outlined what he would do. Copies, reads, asks about difficulties.

E - Outlined what he would do. Thinks before working (Math); sometimes just sits (English).

F - Feels he knows what to do. (asked differently)

G - Tries to complete so he has no homework--more concerned about appearance.

Note: Subjects A, B, C, D, E & G were asked "What do you . . .?" while Subject F was asked, "Do you know what . . .?"

#9 - Do you set out a plan for how you will do an assignment?

A - Yes, first couldn't give example. Look over a question.

B - He makes plans - (Building)--images mentally better than paper.

C - For important assignments decides what will go into each paragraph.

D - Doesn't feel he plans for writing. In autobody, planning is choosing the right tool.

E - Sometimes plans out assignments like essays--not paragraphs.

F - Insisted that he does not plan - just begins to write.

G - Feels he makes plan--title, reading assignment and writing what was remembered.

#14 - Do you feel as though you have direction when you are working?

A - Lost in S.S. (too much to memorize). Feels more directed in English.

B - Usually feels (unintelligible). First time doing a particular assignment he feels lost.

C - Knows where he's going in S.S. Sometimes lost in English (reading problem, poor attention). Seeks direction.

D - Mostly feels directed as he works.

E - Sometimes feels directed but sometimes (usually in English) feels he doesn't know what to do.

F - Sometimes directed.

G - Feels directed in high school; didn't in elementary (was confused).

#19 - Do you set priorities when you have to finish a number of assignments or tasks?

A - At first said he just starts. Makes plans by thinking it over. Tends to do something he likes first.

B - Usually prioritizes the hardest subjects first as they are time consuming.

C - Schoolwork comes first, subjects of fussy teachers first, harder before easier.

D - Unless something important or urgent he makes a list and does things in that order.

E - Schoolwork first, does the easiest subjects first, leaves English until last.

F - Those due first are done first. If two due same day would choose the easier, subjects are not as important as assignment.

G - Does easiest first (some confusion). Boring subjects left until last.

INSPECTS

#3 - Do you inspect your work as you go along?

A - Yes, by looking to see if it is right or wrong (difficult for him to give specifics).

B - Yes, checks for mistakes and redoes portions as he works (building).

C - First said--not really. Reads work after one paragraph--checks as he goes rather than waiting until the end, changes as he goes.

D - Checks autobody as he goes along. Doesn't inspect written work as he goes, might check an exam when finished.

E - Doesn't inspect as he goes along. Gets it down and then goes through or has someone else go through.

F - No.

G - Yes, to see how neat and organized it is. Underlines headings.

#8 - Do you check back on earlier parts of an assignment as you work?

A - Does check back, concentrates on the part he is working on.

B - Doesn't feel he integrates earlier aspects; looks ahead rather than back.

C - Checks back in Math. In writing, looks back only at most recently written sentences.

D - After stopping to think, checks last sentence or two.

E - Yes, looks back at questions.

F - No.

G - Yes, reads what he has written and will rewrite if it lacks cohesion. (Note: Question poorly posed to Subject G.)

#15 - Do you see errors as you work through an assignment?

A - Yes. (Method: reading over.) Later on, in #6 said he sometimes noticed errors.

B - Always checks for errors, may not see them all. (Method: doesn't think he has one.)

C - Sometimes. (Method: marks them and comes back so he won't lose his train of thought.)

D - Mostly. (Method: skims through.)

E - Sometimes--most likely in Math. (Method: read and redo them.)

F - (Not asked. In answering #6 he said he found it hard to identify his errors.)

G - Yes. (Method: if it feels right. In Math, checks calculations and sees the extent to which he needs to ponder.)

REGULATES

#4 - Do you start your assignment as soon as your teacher finishes?

A - Waits a little--thinks what to do.

B - If nothing else to do--the something else might be a plan he would like to draw up--he would first do the teacher's assignment quickly.

C - Yes--doesn't like to put things off in case he forgets.

D - What he does is dependent on what the majority of the class is doing--working or talking.

E - Tries to start immediately but if reading is involved--waits, if he gets lost he stops.

F - Wants to put off work as long as possible because it is boring.

G - Takes a little breather first.

#10 - Do you work out more than one solution to a problem?

A - Sometimes.

B - Would choose easiest or compile features from many (Building). Tries different methods in Math.

C - Sometimes--the odd time not too often.

D - Usually thinks of one solution and does it--feels it is best--agreed he might think of more than one.

E - Not really.

F - No, he doesn't.

G - No.

#16 - Do you tend to make corrections as you work?

A - Yes. Method: reads over or in Math erases and does part of the question.

B - No, not as he goes along. How he makes them depends on subject.

C - Not right then; indicates it and returns later.

D - Just spells by approximation as he works, later asks others for help and rewrites a good copy.

E - Yes, in Math. Sometimes in English.

F - No.

G - No - when he's done, not while he works.

#20 - Do you usually carry through to the end of an assignment?

A - Sometimes loses track of what he is doing.

B - Sometimes he doesn't carry through if it's something he doesn't like to do.

C - Intriguing subjects hold his interest throughout; hard to get down to doing some other subjects.

D - Depends upon whether others are talking; if they are, he talks and finishes his work later.

E - Sometimes he daydreams (English), other times he works until he encounters a legitimate problem, then might leave it.

F - Yes.

G - At first yes, but then admitted he might have lapses where he would rest or draw on his book. He never reads his text; most he reads are directions on a worksheet.

VERIFIES

#5 - Do you think about whether you have done what the teacher asked you to do?

A - He said he's think about it.

B - He tries to extend the assignment beyond what teacher asks for.

C - Not really, guesses he should. Agreed he is very careful to see that he is on the right track before he begins.

D - Yes.

E - Yes and No. Math--yes. Alegbra--no. English--sometimes.

F - No. He does not want to know if he's wrong.

G - Compares his work with the work of his classmates.

#11 - Do you check for errors when you finish an assignment?

A - Yes, reads to himself (paragraphs) or someone else (Math).

B - Checks for errors by going over his work. Likes to work fast and check rather than work more slowly on exams.

C - Yes, by rereading.

D - Checks for errors in autobody as marks depend on his work. In English, checks neatness not content.

E - No, not in Math but sometimes in English.

F - No.

G - Yes, looks over work. Not concerned if can't make corrections.

#17 - Do you proofread your written assignment?

A - Sometimes--value is getting to know about errors.

B - Yes, reads it over.

C - Yes.

D - No.

E - No, his Mom does.

F - Sometimes--proofs essays.

G - Yes.

CORRECTS

#6 - Do you make corrections without your teacher's help?

A - No, then Yes.

B - If he has the capability, yes.

C - Yes. Underlines unsure spelling and changes. Utilizes other people to read his written work. Method: Marks as he works, then returns to correct spelling or rearrange sentences.

D - Whether or not he makes corrections depends on how he feels. He will not if he is tired or mad.

E - Goes back and corrects.

F - Finds it hard to identify errors.

G - Often doesn't make corrections until work is corrected in class. Might go over questions again if there was enough time.

#12 - Do you edit or rewrite original draft work?

A - Sometimes. Method: rewrite.

B - It appears he does (answer not direct). Method: scratches out and uses arrows on rough copy. Then rewrites.

C - Usually but usually does only a first and second copy.

D - Usually does a rough and a good copy.

E - Always has to because of red ink. Method: rewrites on new paper. In Math he just erases part.

F - Sometimes. Method: rewrites a story if it is sloppy.

G - Yes. whether or not he does this depends on the importance of the assignment. An assignment is like presenting yourself, still he does not put much effort into short assignments.

#18 - Do you hand in what you might call a polished product?

A - Yes.

B - No, not always. Depends. Will put more effort in to salvage a class in jeopardy or one he really likes.

C - Yes, but spends more time on important assignments. Does not necessarily redo known weaknesses in lesser assignments.

D - Sometimes. Writing - depends on his interest. Autobody is the best he can do.

E - Sometimes. If he can have a day or two to work, it's polished, if it is done in class, it is not and he doesn't bother to hand it in as teachers couldn't read it.

F - (information not recorded for this subject.)

G - Work is often not as neat as it could be as he leaves it until the last minute.

INSPECTION

After #6 the researcher asked some subjects if they noticed their errors. (Compare with #15.)

A - Sometimes noticed errors.

B - Thinks he does. Notices errors in the work of others more readily than his own. Notices building errors more readily than those in written work. Method: reads over written work, looks at what he is building.

C - About 50-50. Reads over.

D - Yes, but may ignore them for awhile and do them later. Method: autobody: runs his hand over the body; English: reads over, sees how it looks.

E - Sometimes, sometimes not. Has difficulty with spelling errors. Method: goes over and over the assignments.

F - Tries but can't identify.

G - Most of the time. Spelling doesn't look right or feel right (kinesthetically). Length of assignment is also a cue. Method: spelling already related.

ORGANIZED OR DISORGANIZED #21

A - Organized.

B - Organized. Usually active. Others see him as crazy.

C - Varies. Organized at home. School--depends on subject. Has trouble in English or anything whose purpose is difficult.

D - Sometimes organized, sometimes not. Depends on which side of the bed he got up on. How he feels that day.

E - Organized. Has been told he's disorganized. Assumes he is disorganized in schoolwork.

F - Disorganized.

G - Disorganized. Forgets notebook (3 in 1). Locker messy. Disorganized. Doesn't want to be more organized. Cares to be but too lazy to do anything. Tells how he might be more organized.

APPENDIX N

ORGANIZATION OF CONSCIOUS BEHAVIOUR--METACOGNTIVE THEME BY SUBJECT

The following appendix lists metacognitive themes by subject under each of the following headings:

1. General Organization.
2. Planning Skills.
3. Inspection Skills.
4. Regulation Skills.
5. Verification Skills.
6. Correction Skills.

These themes correspond to Step Six in the analysis of the Questionnaire on Organizational Skills.

GENERAL ORGANIZATION

Subject A

#1 - On time

#7 - Is tidy

#13 - Has materials on hand

Subject B

#1 - Usually 10-15 min late

#7 - Average

#13 - Usually

Subject C

#1 - On time

#7 - Tidy at school, not at home

#13 - Usually

Subject D

#1 - Basically on time

#7 - Sometimes

#13 - Necessary materials on hand but nothing extra

Subject E

#1 - Hard in AM

#7 - Room/notes bad, Phys. Ed. O.K.

#13 - Most of time, sometimes not

Subject F

#1 - Usually, sometimes late

#7 - Mostly tidy home and school

#13 - Yeah

Subject G

#1 - Except for first periods--morn, lunch

#7 - Room and locker messy, valuables neat

#13 - Usually, trouble with pens

PLANNING SKILLS

Subject A

#2 - Only knew sometimes.

#9 - Yes, he said he made plans for an assignment but couldn't give an example.

#14 - Lost in S.S. (too much to memorize). Feels more directed in English.

#19 - At first said he just starts, makes plans by thinking it over. Tends to do something he likes first.

Subject B

#2 - Outlined what he would do specifically. In building, he draws first. In English, he starts to write immediately.

#9 - Makes plans for assignments. In building, imagines in his head. Sees better in head than on paper.

#14 - Usually feels (unintelligible). First time doing a particular assignment he feels lost.

#19 - Usually priorizes the hardest subjects first as they are time consuming.

Subject C

#2 - Makes notes of the teacher's directives.
Obtains an appropriate book and makes notes.
If he hasn't understood, he questions the teacher.

#9 - For important assignments, he decides what will go into each paragraph.

#14 - Knows where he is going in S.S. Sometimes lost in English (reading problem--poor attention). Seeks direction.

#19 - Schoolwork comes first, subjects of fussy teachers are done first. Harder subjects are done before easier ones.

Subject D

#2 - Copies the assignment, reads it and then inquires about any portion he doesn't understand.

#9 - Doesn't feel that he plans for writing assignments. In autobody his only planning is to think of the appropriate tool to use.

#14 - Feels mostly directed as he works.

#19 - Makes a list of homework assignments and does them in order that they appear on the list unless there is something important to do such as meeting a deadline in autobody.

Subject E

#2 - In Math, he thinks a bit before working. In English, he usually can't do the assignment so he just sits. If someone reads the assignment to him it's not too bad.

#9 - Sometimes plans out assignment like essays but not paragraphs.

#14 - Sometimes feels directed in an assignment but sometimes (usually in English) he feels he doesn't know what to do.

#19 - Schoolwork is his first priority. He does the easiest subjects first, leaving English until last.

Subject F

#2 - Knows what to do.

#9 - Doesn't set out a plan for assignments or think what he will do, he just begins to write.

#14 - Sometimes feels directed.

#19 - Those assignments due first are done first. If two are due the same day, he would choose to do the easier first. The nature of the assignment is more important in setting priorities than are the subjects themselves.

Subject G

#2 - Does assignment as quickly as possibles so he won't have homework. Accuracy is not important.

#9 - He feels he plans. He writes down the title, then reads the assignment directions and the assignment content, writing down what he remembers, checking back to see if he has forgotten anything.

#14 - Feels directed in High School but was confused in Elementary School.

#19 - Easiest assignments are done first and boring subjects left until last.

INSPECTION SKILLS

Subject A

#3 - Yes, by looking to see if it is right or wrong. Note: Could think of no way to check a Math question if he didn't know what the correct answer should be.

#8 - Doesn't check back. Concentrates on the part he is working on.

#15 - Yes, his method is reading over. Note: Later in 6 ex. he said that he sometimes noticed errors.

Subject B

#3 - Yes, in building he checks for mistakes and redoes portions as he works.

#8 - Doesn't feel he intergrates earlier aspects; looks ahead rather than back.

#15 - Always checks for errors; however, he may not see them all. Didn't think he had a method for checking.

Subject C

#3 - At first he said not really. He reads his work after one paragraph. He checks as he goes rather than waiting until the end. He changes a lot of it.

#8 - Checks back as he works in Math. In writing, he looks back only at the most recently written sectences.

#15 - He sometimes sees the errors as he works but he is fearful of stopping to correct in case he loses his train of thought. His method is to read over the assignment, indicate the errors and come back to them later.

Subject D

#3 - Checks autobody as he goes along. Doesn't inspect written work as he goes along. He might inspect an exam when finished.

#8 - After stopping to think, he checks the last sentence or two.

#15 - He "mostly" sees his errors. He just skims through and if he sees it he sees it - if he doesn't he is not concerned.

Subject E

#3 - Doesn't inspect as he goes along. He gets it down and then goes through it or gets someone else to go through it.

#8 - Yes, he looks back at the questions. (This was in reference to writing a paper.)

#15 - He sometimes sees his errors. Most likely in Math. His method for locating errors is to read it over.

Subject F

#3 - No

#8 - No

#15 - (Subject not given opportunity to answer.)

Subject G

#3 - Yes, to see how neat and organized it is. He underlines headings. His Math is messiest with English next and the other subjects neat.

#8 - Yes, he checks earlier portions as he works. He reads what he has written and will rewrite if his work lacks cohesion. (Question poorly worded.)

#15 - Yes, he sees his errors as he works. His method is to see if it feels right. In Math, he checks his calculations and sees the extent to which he has to ponder.

REGULATION SKILLS

Subject A

#4 - Doesn't start his assignments right away. He waits a little and thinks what to do.

#10 - Sometimes works out more than one solution.

#16 - Yes, makes corrections as he works. He reads over the assignment or, in Math, he erases and redoes part of the question.

#20 - He sometimes loses track of what he is doing and doesn't carry through to the end of an assignment.

Subject B

#4 - Would start the assignment as soon as the teacher gives the instruction if he has nothing else to so. He might draw up a plan first (for building) or finish the required assignment quickly first and then turn to his own work. He tries at other times to extend the assignment beyond the teacher's intent.

#10 - He would choose the easiest solution to a problem or, in building, he would put forth a number of solutions and see what he came up with. He tries different solutions in Math.

#16 - He does not make corrections as he works. How he does make them is dependent on the subject.

#20 - He sometimes doesn't carry through to the end of an assignment if it is something he doesn't like to do.

Subject C

#4 - He begins work immediately so as not to forget details.

#10 - He doesn't often work out alternative solutions to problems. The odd time he does.

#16 - He doesn't make corrections as he works but marks the error and returns to it later.

#20 - Intriguing subjects hold his interest throughout. He finds it hard to get down to doing some other subjects.

Subject D

#4 - When he begins an assignment is dependent on what the majority of the class is doing, whether they are working or talking.

#10 - He usually doesn't think of more than one solution and feels the solution he chooses is usually the best.

#16 - He doesn't make corrections as he works on his rough copy; for example, he would just spell the best he can. On the final copy he wants to do well so he will ask a classmate for correct spellings.

#20 - Whether or not he carries through to the end of an assignment depends upon whether or not others are talking. If they are, he talks too and finishes his assignment later.

Subject E

#4 - He tries to start work immediately but would wait a bit if reading were involved. He looks at the book and tries to read it but if he gets lost he stops.

#10 - He doesn't really work out alternate solutions to problems.

#16 - He makes corrections as he works in Math and sometimes in English.

#20 - He sometimes daydreams in English. Other times he works until he encounters a legitimate problem and then he might leave it.

Subject F

#4 - He doesn't start assignments right away, delaying his start for about 15 minutes by talking. He puts it off as long as possible because he finds it boring.

#10 - He doesn't work out more than one solution to a problem.

#16 - He doesn't make corrections as he works.

#20 - Yes, he works through until the end of an assignment.

Subject G

#4 - Pauses before beginning assignments are usual for him.

#10 - He does not devise more than one solution to a problem.

#16 - He makes corrections when he is done but not while he works.

#20 - At first he said he did work through to the end of assignments but then admitted he might have lapses where he would rest or draw on his book. He never reads his text; the most he ever reads are directions on a worksheet.

VERIFICATION SKILLS

Subject A

#5 - He said he thought about whether he had done what the teacher asked him to do.

#11 - When finished a paragraph he checks for errors by reading to himself or in Math he reads the problems to himself or someone else.

#17 - He sometimes proofreads his written assignments. He sees the value of proofreading in getting to know about errors.

Subject B

#5 - He tries to extend the assignment beyond what the teacher asks for.

#11 - He checks for errors by going over his work. He likes to work fast and then check a test over rather than work more slowly and risk not finishing.

#17 - Yes, he reads over assignments.

Subject C

#5 - He does not compare the completed assignment with the original intention of the assignment although he guesses he should. Agrees that he doesn't like to finish something and find that it is not as it should be.

#11 - He checks for errors when he has finished an assignment by rereading.

#17 - He proofreads his written assignments.

Subject D

#5 - He compares the results of his work with what he was supposed to do.

#11 - He checks for errors in autobody as his marks depend on his work. He is concerned only about neatness in English, he doesn't check for content errors.

#17 - He doesn't proofread written assignments.

Subject E

#5 - Sometimes he thinks about whether he has done what the teacher has asked him to do and sometimes not. In Math, yes, but in Algebra, no. In English, sometimes.

#11 - In some subjects, such as Math, he doesn't check for errors if his answer seems good. He goes over questions more than once in English, looking up answers he questions.

#17 - No, he doesn't proofread his assignments, his mother does.

Subject F

#5 - He does not compare the results of his work with the original assignment to avoid knowing if he has not done well. He also avoids looking at his marks.

#11 - He doesn't check for errors when finished an assignment.

#17 - He proofreads sometimes, for ~~example,~~ in essays.

Subject G

#5 - When finished his work he compares his results to that of another student.

#11 - He looks over his work for errors when he is finished, hesitates, and then works.

#17 - He does proofread written assignments.

CORRECTION SKILLS

Subject A

#6 - At first said he did not make corrections without his teacher's help, then he said he did.

#12 - Sometimes rewrites a draft.

#18 - Yes, he hands in a polished product.

Subject B

#6 - Makes corrections without the teacher's help if he has the capability.

#12 - It seems that he edits by scratching out and using arrows on his rough copy; then rewrites.

#18 - Handing in a polished product depends on circumstances. He will put in more effort if the assignment is for a class which is in jeopardy or if he really likes the class.

Subject C

#6 - He makes corrections without his teacher's help. He marks uncertainties as he works and then goes back to correct spellings or rearrange sentences. He underlines unsure spellings and changes them. He utilizes other people to read his written work.

#12 - Usually edits or rewrites but usually does only a first and second copy.

#18 - Yes, he hands in polished products but spends more time on important assignments. He does not necessarily redo known weak areas in what he perceives to be a less important assignment.

Subject D

#6 - Whether or not he makes corrections without his teacher's help depends on how he feels. He will not make the corrections if he is tired or mad.

#12 - He always does a rough and good copy of an assignment.

#18 - Sometimes he hands in a polished product. In writing the degree of polish depends on his interest. In autobody his work is the best ~~he can do~~.

Subject E

#6 - He goes back and corrects without his teacher's help.

#12 - He always has to edit or rewrite because of the red ink. He rewrites on new paper or in Math he erases just part of the question.

#18 - Sometimes he hands in a polished product. If he can have a day or two to work on an assignment, his work is polished. However, if it is done in class, it is not polished. In the latter case he doesn't bother to hand it in as it could not be read.

Subject F

* #6 - He finds it hard to identify errors.

#12 - Sometimes edits or rewrites original draft. He will rewrite a story if it is sloppy.

#18 - (information not recorded for this subject.)

* not asked properly.

Subject G

#6 - He often doesn't make corrections until the work is corrected in class. He might go over questions again if there was enough time.

#12 - Yes, he edits or rewrites original draft work. Whether or not he does this depends on the importance of the assignment. He described an assignment like "presenting yourself" but in spite of that description he does not put much effort into assignments.

#18 - His work is not often as neat as it could be as he leaves assignments until the last minute.

Appendix O

FURTHER CRITERIA FOR LABELLING VERBALIZATIONS FROM THE QUESTIONNAIRE ON ORGANIZATIONAL SKILLS: STEP ELEVEN OF ANALYSIS

Word

If a word was used to agree with or disagree with or parrot the examiner's comment, it was rated as a word followed by one of the three descriptors just outlined.

Examiner:	Do you just begin to write?
Subject D:	Yep.
Is labelled:	**[Word (agree)]**

If the examiner is paraphrasing the subject's earlier remarks and the subject agrees or disagrees with her paraphrase, the subject's verbalization is labelled only as word.

Comments

Statements of agreement/disagreement with no further qualifier are given a third descriptor of agree/disagree.

Example:	Basically, yeah,
Is labelled:	**[Comment (general) (agree)]**

Statements of agreement which have a further qualifier do not have the third descriptor as they go behond what the examiner has said.

Example:	Yeah. Much easier.
Is labelled:	**[Comment (general)]**

Statements of agreement which contain a further qualifier which is taken from the examiner's words is labelled with a third descriptor of parrot.

Example:

Examiner: So, indeed, it might not be along the same line but there might be some changes made.

Subject B: It would - It would be along the same line.

Is labelled: **[Comment (general) (parrot)]**

Appendix P

EXPLANATIONS BEHIND CHOICES ON THE ELICITATION PHASE OF THE TEXT SEARCH TASK

Examiner question coming before responses recorded below is "which is the best of these three methods?"

Subject A

Demo 1

S: The last one.

E: Why?

S: Because it has a glossary so that you can (mumble) any words you want to find out know about you can look up the page.

E: O.K.

S: Look it up.

E: So why is it the best method? You can look it up and

S: It's the easiest way of finding it.

Demo 2

S: The last one.

E: Why?

S: Because it would be easier to find the - what you're looking for in the glossary.

E: When you say its easier, what do you mean by that?

S: Because its arranged alphabetically so that you find it quickly.

Subject B

Demo 1

S: The second one.

E: The second one?

S: Yeh - 'cause you're just - O.K. You're looking for the parts of the body of the insect - right - O.K. So - you just have to look in the - what do you call it - the table of contents?

E: Mhm

S: Just find it under insects and as soon as you find insects you can just go to the chapter where it's on and look through the whole chapter there's no sense in looking through the glossary unless you want to find definitions of words that you don't understand too well..

Comment: Subject misunderstood the role of the index/glossary.

Demo 2

S: O.K. The last one was the best because it shuwed the different - O.K. it showed how places can be different found - O.K - It was better because you can find places in the book - different places where carbon dioxide could be lo - would - be located.

Subject C

Demo 1

S: The third way

E: Why?

S: O.K. The first way you just sort of flipped through lookin for pictures ummmm and then you'd have to - once you'd seen some pictures then you'd have to look around do a lot of reading and find out exactly what's - where you are and that type of the thing. The second way you'd just looked in the first part - what's that called?

E: The table of contents

S: Table of contents and ah - then you looked for what you were - the insect - body of insect bodies and then you turned to that page and that was the second way - the third way you found out exactly how many pages of information there were and that would be the best way.

Comment: Subject C tends to describe what has just happened.

Demo 2

S: Ah - I think the third way was the best. Again you were looking at the table of contents - and found the page that the plants were on and then you looked back to the glossary and um - you found like page 145 had more on it and you didn't know that with the other two ways - so then you realized that there was more in the book than you originally thought.

Subject D

Demo 1

S: The index.

E: Why?

S: Well, it depends - like if you're in class and you just want to screw around the whole class - flip through it - if you want to get the answers done fast, you look in the index.

Note: Only one demonstration was done with Subject D.

Subject E

Demo 1

S: The last one.

E: Cause it was quicker.

Demo 2

S: The third one.

E: Why?

S: Cause ah maybe the second one - the second and third one were both good 'cause they got you to the chapter you found it and you still flipped through it - the time you waste lookin in the back you could just flip (mumble) but this is better 'cause if it's not printed out big you catch it the other way.

Subject F

Demo 1

S: mmm the third one

E: Why?

S: Because - you're - the first one you only look through the book tryin' to find a picture - and they may not have a picture

E: Right

S: The second one you just look up the main heading - while the third one you look up the main heading and you turn to that page and then you look up to the back - and you'd probably find it a lot easier..

E: O.K. so you think it would be easier and anything else why it's better?

S: Quicker

Demo 2

S: The third

E: The third - and your reasons again?

S: It's quicker

E: K.

S: It's easier - and the other two take too long - have to flip through..

(Examiner attempts to draw from subject conclusions regarding information given on range of pages)

S: That - it's - ah - more than one page.

Subject G

Demo 1

S: Last one

E: Why?

S: ..because you were organized - you could find it right away and you know it was what you were looking for...

E: O.K. What do you think about the other method I used?

S: Well - they're not bad - but - kinda sloppy and you don't know if you had the correct - correct assignment or whatever

Demo 2

S: Well - the last one..

E: O.K. and why?

S: Well, it's easier to find than paging through - a whole book -

(Discussion where examiner is attempting to draw a conclusion from the subject regarding the information given in the index regarding the range of pages - subject diverted to say the following:)

S: Well, I think there's kind of a - a - well, it's a little bit more difficult - I can't see why you wouldn't just look in the index and then look under p for plants when you get there look for algae - then go..

E: O.K.

S: ..to this page

E: Rather than starting with the table of contents?

S: Yeah

Appendix Q

QUESTIONNAIRE ON ORGANIZATIONAL SKILLS--ANALYSIS

STEP ONE (Subject E)

In the pages that follow, the full transcripts for Subject E's responses to the **Questionnaire Regarding Study Habits** are reproduced. While the analysis of this data may be found in Chapter V, the data reduction and labelling processes may be more clearly understood by referring to this and the immediately following Appendices while reading the text of the study. Appendices Q, R, S, T, U and V reveal greater detail regarding the analysis procedures.

Verbatim Transcript

Subject E - Transcript

Examiner: Now, I'm going to ask you some more questions. Are you on time for class?

Subject: Try to - sometimes - most of the time. Well, this year's been bad - about being on time. Usually I'm pretty good, except in the mornings.

Examiner: Is that because you find it hard to crawl out?

Subject E: Yeah. Mornings are pretty rough.

Examiner: Does it have anything to do with the subjects you're taking too? If you like the class - you're likely to be on time?

Subject E: Yeah, more likely. Like Phys. Ed. (mumble). I'm never late and then I feel bad if I'm late. Last year I never missed a class in Phys. Ed. through the whole year.

Examiner: That's good.

Subject E: I just - Phys. Ed. - I feel bad if I miss a class. Even for illness, I feel bad, I don't feel good.

Examiner: That's a real love for you isn't it? You really like it.

Subject E: Yeah. Yeah.

Examiner: What do you do after the teacher first tells you what to do in an assignment? What do you do? The teacher's at the front of the class: she gives - he gives an assignment. What do you do? Picture yourself - and it might be different for different classes, so feel free to tell me that. Picture yourself in a class and the teacher gives you an assignment - and then - tell me basically what you do.

Subject E: Think about it a bit. And then find - like if it's Math - look up the page and all that - start - tryin' to do it. If it's a English or a reading assignment - I try to do it and it usually doesn't work out so I sit there - but last year or the year before it wasn't so bad 'cause I got other students to help me read and (mumble) it was pretty bad.

Examiner: Did the teacher suggest that you get other people to help you to read or is that something..

Subject E: Sometimes. Sometimes.

Examiner: So does that depend on the teacher?

Subject E: Yeah. I don't like asking, going up and asking - you know..

Examiner: Yeah.

Subject E: "I can't read. Can someone else read to me?" I hate doing it. 'Cause I don't know. I don't feel - seems like - to me - I feel like I'm sucking up to them.

Examiner: Yeah.

Subject E: It's just - I don't feel good asking. I don't feel like going - going out of my way. It's stupid. My mom's told me it's stupid and Mrs. ____ (resource teacher) told me it's stupid, you know, but I don't feel good about going up to a teacher that I never met before, and saying, "Hey, look it, I can't read very good, I got a reading problem." Like I'm asking if, to me it feels like I'm asking for special privileges.

Examiner: Uhm, mm. Would it be easier for you if someone else did that for you like Mrs. ____ (resource teacher) or someone else?

Subject E: It's easier that way. Then I don't think - but - then I don't feel like doing it. I did this year, it was hard - it was real hard. I went to my Chem and biology teacher and I told him - it was really hard to do. I didn't like it.

Examiner: Yeah, I can understand that.

Subject E: I never used to ever tell my teachers. They'd find out someway or they'd never find out.

Examiner: Yeah.

Subject E: But I never go and tell them. 'Cause I just - this year I just thought - well - I'll have to go ask.

Examiner: If someone else did that telling for you, and there could be someone who was sort ~~of, like~~ if you had a friend in the class that you'd arrange that with so you do it subtly, it would be easier wouldn't it?

Subject E: Yeah. Much easier.

Examiner: Sort of a buddy, like in swimming.

Subject E: They've done it - that's happened before.

Examiner: But, is it always sort of a new start, like every new class, every - you've got to go over it and over it.

Subject E: I hate the starting of school, because, you know, when you start school, you don't know them, they don't know you and that and unless they know you if there's some reading that they're doing out loud. It always fails that I always get asked and I hate it. Ah - I just - I get cold chills up my back - I just hate it. 'Cause I feel such - such a dummy and I think about all those other guys thinkin', "what's this guy doin'?" This year 'specially, because I've been taking Grade 10 courses and I'm in second year Grade 12 - just don't feel good - I didn't like it.

Examiner: Well, I think it's pretty courageous of you, because you're doing it aren't you? Because you want to go ahead and take some courses in Phys. Ed. so you're sort of jumping in the deep end. I think it's really good that you're doing it.

Subject E: I wish you could say that to my Dad, when my report card goes back!

Examiner: Well, you know, the thing about having reading difficulty is that, you know, it's the same thing, you wouldn't think of trying to get along without your glasses, I mean, you wouldn't! And when you have a reading difficulty and there are certain things that you need to assist you so that your intelligence can work. But it's really difficult sometimes to get those things, I know.

Subject E: I find it a bit frustrating.

Examiner: One of the things that sometimes helps it, too, is if you can find somebody else - I'm sure there are other people in the school who know exactly the way you do and are in exactly the same boat, but you don't know who they are and they don't know who you are. And, just sort of, if you know one or two people and you could share your frustrations, it would be a little easier, like it's one thing to talk to - someone who doesn't understand, I mean other people understand, but nobody understands it the way you do.

Subject E: And I just wish some people - you know - I've said that to a good friend of mine - I wish he could just go a day like I have to. I just wish that sometimes. When people make fun of me I wish they'd go through it a couple days of it, like how I am.

Examiner: I do that to teachers. I have constructed a number of pages that it's impossible for them to read. And I make them stand up in front of other teachers in workshops and try to read it. And I make fun of them. And, you know, it's maybe not such a nice thing to do, but they have a whole different feeing when they leave.

Subject E: It's an awful feeling.

Examiner: And they tell me that will, you know, that gave a different understanding of what it's like too. Another thing that I always say to them is, Now, were you any less intelligent when you were reading than you were before or you are now? And they say, No. And I say, You just remember that, because it's not got anything to do with a person's intelligence. It seems people have to, when you say to go through it for a day or so, people have to do it.

Subject E: It's really awful.

Examiner: One of the things that Oh I'm getting off the topic - really. I've got a couple of different fellows that I worked with in high school in Saskatoon and they come around with me and we did some workshops for teachers and it just helps them to understand bit. And once they understand I - like you found there are some teachers that are really - really helpful and others - it's not that they mean to be cruel, it's just that they don't understand.

Subject E: Yeah.

Examiner: This beginning to be a..

(Laughter)

Examiner: And you're the one that's supposed to be talking. I've lost my place completely here. Were we back to what you do after the teacher tells you to do an assignment, wasn't that where we started?

Subject E: We did that.

Examiner: Yes, and what you do. And you said that you were saying that sometimes you just sit.

Subject E: Yeah.

Examiner: Rather than going through the embarrassment of trying to ask somebody to read for you.

Subject E: Yeah. I'll do that. I did that a lot.

Examiner: So then what happens when you have the assignment to do? Does the teacher get angry?

Subject E: I don't usually hand it in.

Examiner: Yeah.

Subject E: I usually just take it. It's a bit dumb I guess but - I don't know - It's hard to describe.

Examiner: Well, it's a difficult situation to be in, like you said, you went through when you talk to your teachers this time around.

Subject E: Uhm.

Examiner: I can understand. It's a different thing when you're with the same people and there's someone you could follow through and you don't have to keep repeating it. Do you inspect your work as you go along?

Subject E: Don't know.

Examiner: Inspect it, like, do you..

Subject E: Not usually. I usually just get it all down.

Examiner: Uh, hum.

Subject E: And then go through it or else I have to get someone else to go through it.

Examiner: Do you start a task immediately?

Subject E: Uhh, sometimes. Try to.

Examiner: What would be cases where you would and you wouldn't?

Subject E: Uh, with reading I probably would wait a bit.

Examiner: All right.

Subject E: Mm - I'd look at the book - If the book seemed - I'd start tryin' to read it and that - if I get so far; if I just didn't understand it. I get lost if I drop it or stop it. I've done that, and in math I usually I try to get right on it.

Examiner: Do you compare the results of the work with what you're supposed to do, like when you get all done, to see what you have or done what the teacher told you to do? Do you do that?

Subject E: Ah, yeah, and no. In Math I do, but in Algebra, no I don't. And in English, sometimes.

Examiner: Do you make corrections that you notice by yourself, like, if you see something and you know it's wrong, do you go back and correct it? Or do you tend to leave it?

Subject E: In my own work?

Examiner: Uhm, hum.

Subject E: Yeah, I'll go back and correct it.

Examiner: Do you tend to notice errors?

Subject E: Sometimes, like something's (mumble) sometimes not - not spelling errors I don't notice them - like some people do.

Examiner: Do you use a method for going back and looking for things that are wrong?

Subject E: Do I use a method?

Examiner: Yes.

Subject E: No. I just usually go over and over it.

Examiner: O.K. That's a method.

Subject E: Oh.

(Laughter)

Examiner: So you sort of start at the beginning and just read it through. Would you say that you're tidy about your personal belongings?

Subject E: My personal belongings? How do you mean?

Examiner: Well, if I looked into your room. Would I faint?

(Laughter)

Subject E: Sometimes, it gets pretty bad. I don't know I - it just depends. I like keeping clean, my notebooks are usually so messy 'cause notes - I can't keep them in order - it doesn't - in order because they don't make sense anyways. It's usually just thrown in there. My Phys. Ed. stuff, I'm usually pretty neat about that. See, Phys. Ed. locker is always neat. I don't know.

Examiner: So it sort of depends.

Subject E: Yeah.

Examiner: Do you integrate earlier aspects of something you are doing by checking back as you work. Say, if you're writing a paper, would you look back as you're working to make sure that you are doing the right then is connected?

Subject E: Yes, I look back at the questions. Yeah.

Examiner: Do you make a plan for an assignment?

Subject E: Hum.

Examiner: Or do you jump right in?

Subject E: Sometimes I make a plan, of what I want to say.

Examiner: What kind of assignment would you tend to make a plan in?

Subject E: An essay. An - sometimes, writing a paper. Like when they say write a paragraph about it, I just get right down..

Examiner: Do you work out alternate solutions to problems, like if you know there's more than one way to do it you sort of think about that and then choose one way or do you tend to feel quite sure of the answer to do it another way?

Subject E: Not really.

Examiner: O.K. Do you check for errors when you're finished an assignment?

Subject E: No. If I get through it and get a good answer - usually - no. I hope it's the right one. Sometimes - it's like it's a..

Examiner: What subjects are you talking about?

Subject E: Math usually one I get the answer. I think that's the answer. But English sometimes I'll go over the question again and look up my answers and see if it's right.

Examiner: O.K. Do you work out - oh I asked you that, and I'm not going to ask you again. Do you rewrite an original draft, say, you write something out once, then do you write it out again?

Subject E: Yeah, I always have to. So much red ink on it that I have to.

Examiner: And when you do something like that do you just sort of totally rewrite it starting from the beginning and write it all over again or do you erase some parts?

Subject E: Yeah. Rewrite it over on a new piece of paper.

Examiner: How about math, how would you do that?

Subject E: Uhm, math, actually sometimes I'm neat in Math, then I'll just erase.

Examiner: That part?

Subject E: Yeah. I don't usually try to do it in pencil.

Examiner: Do you have on hand the necessary materials that you need to do an assignment like your pen, your notebook, your eraser and that kind of thing, or do you have to "psst hey! Can I borrow..?"

Subject E: Sometimes. Most of the time I have it. Sometimes I don't though.

Examiner: Do you feel directed or like you know where you're going when you do an assignment?

Subject E: Sometimes, and sometimes I don't. I don't know what to do. Where to go.

Examiner: Sometimes you feel lost.

Subject E: Yeah. In English I usually feel lost.

Examiner: What do you do when you're lost?

Subject E: I don't know. Uh, panic - no, not again ah, - ask the teacher for suggestions - what he means.

Examiner: O.K. And if the first answer isn't good, would you ask another one? If you still can't get hold of it?

Subject E: Yeah. Still don't know what ya mean.

Examiner: O.K. And then what would you do?

Subject E: If I'm still lost?

Examiner: Uhm hum.

Subject E: I don't know. Trying to think back. Write down what I thought and - I don't know.

Examiner: O.K. Do you see errors as you work through an assignment? Do you see your errors as you're working?

Subject E: Umm. Sometimes, not all the time.

Examiner:	Where would you be likely to see them?
Subject E:	In Math.
Examiner:	Do you have a method for looking for errors?
Subject E:	Just read them - redo them - the question. (mumble) I'd go over it again.
Examiner:	Do you tend to make corrections as you work?
Subject E:	Yeah, in Math, yeah.
Examiner:	In Math.
Subject E:	Sometimes in English too.
Examiner:	Do you proofread your written assignments?
Subject E:	No, no, I don't. I usually get my Mom to.
Examiner:	Would you say that you tend to hand in a polished product? When you hand something in, do you feel it's really quite nice? Would you say it's well done?
Subject E:	Sometimes, if I don't have to hand it in, like that class, if I can have a day or two to work on it, it's usually polished. But if it's to be done in the class then usually most of the times I won't get it in because it won't be finished and he can't - teacher wouldn't be able to read it anyway.
Examiner:	O.K. Do you set priorities when you have a series of things to do, like in a class or for homework, do you set priorities? That means have something to do before something else?
Subject E:	Yeah.

Examiner: O.K. How do you do that?

Subject E: Uhm.

Examiner: What do you base that on?

Subject E: I always have to have all my school work done before I can do anything else.

Examiner: O.K.

Subject E: Usually, sometimes but not..

Examiner: Within your school work, what - how would you set your priorities?

Subject E: Homework.

Examiner: Yeah.

Subject E: Have it done then I can go..

Examiner: What if you have three different subjects to do for homework, how would you set priorities in which work you do first?

Subject E: Oh, ah - usually the easiest one first. I leave English 'til last.

Examiner: O.K. Do you carry through to the end of an assignment, unless you run into a legitimate problem, by legitimate problem, I mean - like you couldn't read the question, or like you get stuck in a method, or do you sometimes tend to daydream or just leave that? Do you tend to..

Subject E: Both. Sometimes daydream, sometimes I go ahead until I can't do it, sometimes just leave the question, or leave it out.

Examiner: What would make you tend to one or the other of those things?

Subject E: Uh - What would - Let me think now - something happening - somethings happened.

Examiner: Yeah and you were upset about something you mean..

Subject E: Yeah.

Examiner: Would the subject have anything to do with it?

Subject E: Sometimes English, I used to daydream a lot.

Examiner: Do you see yourself as an organized person or a disorganized person?

Subject E: Organized.

Examiner: O.K.

Subject E: Sometimes disorganized - I've been told.

(Laughter)

Examiner: What situations would you be disorganized in, when would you be told you were disorganized.

Subject E: I don't know. School work and that.

Examiner: Nothing that comes right to mind.

Subject E: No.

Appendix R

QUESTIONNAIRE ON ORGANIZATIONAL SKILLS

STEP TWO (Subject E)

Note: Bracketed verbalizations separate meaning units. Each meaning unit is numbered in the right hand column at its conclusion. Stimulus Questions are underlined.

Verbatim Transcript Divided into Meaning Units

Stimulus Question		Subject E-- Transcript	Meaning Unit Number
—	Examiner:	Now, I'm going to ask you some more questions.	
#1		Are you on time for class?	
	Subject E:	[Try to - sometimes - most of the time. Well, this year's been bad - about being on time. Usually I'm pretty good, except in the mornings.	
	Examiner:	Is that because you find it hard to crawl out?	
	Subject E:	Yeah. Mornings are pretty rough]	1
	Examiner:	Does it have anything to do with the subjects you're taking too? If you like the class - you're likely to be on time?	
	Subject E:	[Yeah, more likely. Like Phys. Ed. (mumble). I'm never late and then I feel bad if I'm late. Last year I never missed a class in Phys. Ed. through the whole year.	
	Examiner:	That's good.	
	Subject E:	I just - Phys. Ed - I feel bad if	

I miss a class. Even for illness, I feel bad, I don't feel good.

Examiner: That's a real love for you isn't it? You really like it.

Subject E: Yeah. Yeah.] 2

#2 Examiner: What do you do after the teacher first tells you what to do in an assignment? What do you do? The teacher's at the front of the class: she gives - he gives an assignment. What do you do? Picture yourself - and it might be different for different classes, so feel free to tell me that. Picture yourself in a class and the teacher gives you an assignment - and then - tell me basically what you do.

Subject E: [Think about it a bit. And then find - like if it's Math - look up the page and all that - start tryin' to do it.] [If it's a 3
English or a reading assignment - I try to do it and it usually doesn't work out so I sit there] 4
- [but last year or the year before it wasn't so bad 'cause I got other students to help me read and (mumble) it was pretty bad.] 5

Examiner: Did the teacher suggest that you get other people to help you to read or is that something..

Subject E: Sometimes. Sometimes.

Examiner: So does that depend on the teacher:

Subject E: Yeah. [I don't like asking, going up and asking - you know..

Examiner: Yeah.

Subject E: "I can't read. Can someone else read to me?" I hate doing it. 'Cause I don't know. I don't feel - seems like - to me - I feel like

I'm sucking up to them.

Examiner: Yeah.

Subject E: It's just - I don't feel good asking. I don't feel like going - going out of my way. It's stupid. My mom's told me it's stupid and Mrs. ____ (resource teacher) told me it's stupid, you know, but I don't feel good about going up to a teacher that I never met before, and saying, Hey, look it, I can't read very good, I got a reading problem. Like I'm asking if, to me it feels like I'm asking for special privileges.] 6

Examiner: Uhm, mm. Would it be easier for you if someone else did that for you like Mrs. ____ (resource teacher) or someone else?

Subject E: [It's easier that way.] [Then I 7
don't think - but - then I don't
feel like doing it. I did this
year, it was hard - it was real
hard. I went to my Chem and
biology teacher and I told him -
it was really hard to do. I
didn't like it.

Examiner: Yeah, I can understand that.

Subject E: I never used to ever tell my teachers. They'd find out someway or they'd never find out.

Examiner: Yeah.

Subject E: But I never go and tell them. 'Cause I just - this year I just thought - well - I'll have to go ask.] 8

Examiner: If someone else did that telling for you, and there could be someone who was sort of, like if you had a friend in the class that you'd arrange that with so you do it subtly, it would be easier wouldn't it?

Subject E: [Yeah. Much easier.

Examiner: Sort of a buddy, like in swimming.

Subject E: They've done it - that's happened before.] 9

Examiner: But, is it always sort of a new start, like every new class, every - you've got to go over it and over it.

Subject E: [I hate the starting of school,
because, you know, when you start
school, you don't know them, they
don't know you and that and
unless they know you if there's
some reading that they're doing
out loud. It always fails that I
always get asked and I hate it.
Ah - I just - I get cold chills
up my back - I just hate it.
'Cause I feel such - such a dummy
and I think about all those other
guys thinkin', "what's this guy
doin'?"] [This year 'specially, 10
because I've been taking Grade 10
courses and I'm in second year
Grade 12...just don't feel good -
I didn't like it.] 11

Examiner: Well, I think it's pretty courageous of you, because you're doing it aren't you? Because you want to go ahead and take some courses in Phys. Ed. so you're sort of jumping in the deep end. I think it's really good that you're doing it.

Subject E: [I wish you could say that to my Dad, when my report card goes back!] 12

Examiner: Well, you know, the thing about having reading difficulty is that, you know, it's the same thing, you wouldn't think of trying to get along without your glasses, I mean, you wouldn't! And when you have a reading difficulty and there are certain things that you need to assist you so that your intelligence can work. But it's really difficult sometimes to get those things, I know.

Subject E: [I find it a bit frustrating.] 13

Examiner: One of the things that sometimes helps it, too, is if you can find somebody else - I'm sure there are other people in the school who know exactly the way you do and are in exactly the same boat, but you don't know who they are and they don't know who you are. And, just sort of, if you know one or two people and you could share your frustrations, it would be a little easier, like it's one thing to talk to - someone who doesn't understand, I mean other people understand, but nobody understands it the way you do.

Subject E: [And I just wish some people - you know - I've said that to a good friend of mine - I wish he could just go a day like I have to. I just wish that sometimes. When people make fun of me I wish they'd go through it a couple days of it, like how I am.] 14

Examiner: I do that to teachers. I have constructed a number of pages that it's impossible for them to read. And I make them stand up in front of other teachers in workshops and try to read it. And I make fun of them. And, you know, it's maybe not such a nice thing to do, but they have a whole different feeling when they leave.

Subject E: [It's an awful feeling.

Examiner: And they tell me that will, you know, that have a different understanding of what it's like too. Another thing that I always say to them is, Now, were you any less intelligent when you were reading than you were before or you are now? And they say, No. And I say, You just remember that, because it's not got anything to do with a person's intelligence. It seems people have to - when you say to go through it for a day or so - people have to do it.

Subject E: It's really awful.] 15

Examiner: One of the things that Oh I'm getting off the topic - really. I've got a couple of different fellows that I worked with in high school in Saskatoon and they come around with me and we did some workshops for teachers and it just helps them to understand bit. And once they understand I - like you found there are some teachers that are really - really helpful and others - it's not that they mean to be cruel, it's just that they don't understand.

Subject E: Yeah.

Examiner: This beginning to be a..

(Laughter)

Examiner: And you're the one that's supposed to be talking. I've lost my place completely here. Were we back to what you do after the teacher tells you to do an assignment, wasn't that where we started?

#2 repeated

Subject E: We did that.

Examiner: Yes, and what you do. And you said that you were saying that sometimes you just sit.

Subject E: Yeah.

Examiner: Rather than going through the embarrassment of trying to ask somebody to read for you.

Subject E: Yeah. I'll do that. I did that a lot.] 16

Examiner: So then what happens when you have the assignment to do? Does the teacher get angry?

Subject E: [I don't usually hand it in.] 17

Examiner: Yeah.

Subject E: [I usually just take it. It's a bit dumb I guess but - I don't know - It's hard to describe.] 18

Examiner: Well, it's a difficult situation to be in, like you said, you went through when you talk to your teachers this time around.

Subject E: Uhm.

#3 Examiner: I can understand. It's a different thing when you're with the same people and there's someone you could follow through and you don't have to keep repeating it. Do you inspect your work as you go along?

Subject E: Don't know.

Examiner: Inspect it, like, do you...

Subject E: [Not usually.] [I usually just get it all down. 19

Examiner: Uh, hum.

Subject E: And then go through it or else I have to get someone else to go through it.] 20

#4 Examiner: Do you start a task immediately?

Subject E: [Uhh, sometimes. Try to.

Examiner: What would be cases where you would and you wouldn't?

Subject E: Uh, with reading I probably would wait a bit.] 21

Examiner: All right.

Subject E: [Mm - I'd look at the book - If the book seemed - I'd start tryin' to read it and that - if I get so far; if I just didn't understand it. I get lost if I drop it or stop it. I've done that, and in math I usually I try to get right on it.] 22

#5 Examiner: Do you compare the results of the work with what you're supposed to do, like when you get all done, to see what you have or done what the teacher told you to do? Do you do that?

Subject E: [Ah, yeah, and no. In Math I do, but in Algebra, no I don't. And in English, sometimes.] 23

#6 Examiner: Do you make corrections that you notice by yourself, like, if you see something and you know it's wrong, do you go back and correct it? Or do you tend to leave it?

Subject E: [In my own work?

Examiner: Uhm, hum.

Subject E: Yeah, I'll go back and correct it.] 24

Examiner: Do you tend to notice errors?

Subject E: [Sometimes, like something's (mumble) sometimes not - not spelling errors I don't notice them - like some people do.] 25

Examiner: Do you use a method for going back and looking for things that are wrong?

Subject E: Do I use a method?

Examiner: Yes.

Subject E: [No. I just usually go over and over it.] 26

Examiner: O.K. That's a method.

Subject E: Oh.

(Laughter)

Examiner: So you sort of start at the beginning and just read it
#7 through. Would you say that you're tidy about your personal belongings?

Subject E: My personal belongings? How do you mean?

Examiner: Well, if I looked into your room. Would I faint?

(Laughter)

Subject E: [Sometimes, it gets pretty bad.I
don't know I - it just depends.
I like keeping clean,] [my note- 27
books are usually so messy 'cause
notes. I can't keep them in order
- it doesn't -in order because
they don't make sense anyways.
It's usually just thrown in
there.] [My Phys. Ed. stuff, I'm 28
usually pretty neat about that.
See, Phys. Ed. locker is always
neat.] I don't know. 29

Examiner: So it sort of depends.

Subject E: [Yeah.] 30

#8 **Examiner:** Do you integrate earlier aspects of something you are doing by checking back as you work. Say, if you're writing a paper, would you look back as you're working to make sure that you are doing the right then is connected?

Subject E: [Yes, I look back at the questions. Yeah.] 31

#9 **Examiner:** Do you make a plan for an assignment?

Subject E: Hum.

Examiner: Or do you jump right in?

Subject E: [Sometimes I make a plan, of what
I want to say.

Examiner: What kind of assignment would you
tend to make a plan in?

Subject E: An essay. An - sometimes, writing
a paper.] [Like when they say write 32
a paragraph about it, I just get
right down..] 33

#10 Examiner: Do you work out alternate
solutions to problems, like if
you know there's more than one way
to do it you sort of think about
that and then choose one way or do
you tend to feel quite sure of
the answer to do it another way?

Subject E: [Not really.] 34

#11 Examiner: O.K. Do you check for errors when
you're finished an assignment?

Subject E: [No. If I get through it and get
a good answer - usually - no. I
hope it's the right one.
Sometimes - it's like it's a ..

Examiner: What subjects are you talking
about?

Subject E: Math usually one I get the answer.
I think that's the answer.] [But 35
English sometimes I'll go over the
question again and look up my
answers and see if it's right.] 36

Examiner: O.K. Do you work out - oh I
asked you that, and I'm not going
#12 to ask you again. Do you rewrite
an original draft, say, you write
something out once, then do you
write it out again?

Subject E: [Yeah, I always have to. So much
red ink on it that I have to.] 37

Examiner: And when you do something like
that do you just sort of totally

rewrite it starting from the beginning and write it all over again or do you erase some parts?

Subject E: [Yeah. Rewrite it over on a new piece of paper.] 38

Examiner: How about math, how would you do that?

Subject E: [Uhm, Math, actually sometimes I'm neat in Math, then I'll just erase.

Examiner: That part?

Subject E: Yeah. I don't usually try to do it in pencil.] 39

#13 Examiner: Do you have on hand the necessary materials that you need to do an assignment like your pen, your notebook, your eraser and that kind of thing, or do you have to "psst hey! Can I borrow..?"

Subject E: [Sometimes. Most of the time I have it. Sometimes I don't though.] 40

#14 Examiner: Do you feel directed or like you know where you're going when you do an assignment?

Subject E: [Sometimes, and sometimes I don't. I don't know what to do. Where to go.

Examiner: Sometimes you feel lost.

Subject E: Yeah. In English I usually feel lost.] 41

Examiner: What do you do when you're lost?

Subject E: I don't know. [Uh, panic - no, not again ah, - ask the teacher for suggestions - what he means.] 42

Examiner: O.K. And if the first answer isn't good, would you ask another one? If you still can't get hold of it?

Subject E: Yeah. Still don't know what ya mean.

Examiner: O.K. And then what would you do?

Subject E: If I'm still lost?

Examiner: Uhm hum.

Subject E: [I don't know. Trying to think back. Write down what I thought and - I don't know.] 43

#15 Examiner: O.K. Do you see errors as you work through an assignment? Do you see your errors as you're working?

Subject E: [Umm. Sometimes, not all the time.] 44

Examiner: Where would you be likely to see them?

Subject E: [In Math.] 45

Examiner: Do you have a method for looking for errors?

Subject E: [Just read them - redo them - the question. (mumble) I'd go over it again.] 46

#16 Examiner: Do you tend to make corrections as you work?

Subject E: [Yeah, in Math, yeah.

Examiner: In Math.

Subject E: Sometimes in English too.] 47

#17 Examiner: Do you proofread your written assignments?

Subject E: No, no, I don't. I usually get my Mom to.] 48

#18 Examiner: Would you say that you tend to hand in a polished product? When you hand something in, do you feel it's really quite nice? Would you say it's well done?

Subject E: [Sometimes, if I don't have to
hand it in, like that class, if I
can have a day or two to work on
it, it's usually polished.] [But 49
if it's to be done in the class
then usually most of the times I
won't get it in because it won't
be finished and he can't - teacher
wouldn't be able to read it
anyway.] 50

#19 **Examiner:** O.K. Do you set priorities when you have a series of things to do, like in a class or for homework, do you set priorities? That means have something to do before something else?

Subject E: [Yeah.

Examiner: O.K. How do you do that?

Subject E: Uhm.

Examiner: What do you base that on?

Subject E: I always have to have all my school work done before I can do anything else.] 51

Examiner: O.K.

Subject E: Usually, sometimes but not..

Examiner: Within your school work, what - how would you set your priorities?

Subject E: Homework.

Examiner: Yeah.

Subject E: Have it done then I can go..

Examiner: What if you have three different subjects to do for homework, how would you set priorities in which work you do first?

Subject E: [Oh, ah - usually the easiest one first. I leave English 'til last.] 52

#20 Examiner: O.K. Do you carry through to the end of an assignment, unless you run into a legitimate problem, by legitimate problem, I mean - like you couldn't read the question, or like you get stuck in a method, or do you sometimes tend to daydream or just leave that? Do you tend to..

Subject E: [Both. Sometimes daydream, sometimes I go ahead until I can't do it, sometimes just leave the question, or leave it out.] 53

Examiner: What would make you tend to one or the other of those things?

Subject E: [Uh - What would - Let me think now - something happening - somethings happened.

Examiner: Yeah and you were upset about something you mean..

Subject E: Yeah.] 54

Examiner: Would the subject have anything to do with it?

Subject E: [Sometimes English, I used to daydream a lot.] 55

#21 Examiner: Do you see yourself as an organized person or a disorganized person?

Subject E: [Organized.] 56

Examiner: O.K.

Subject E: [Sometimes disorganized - I've been told.

(Laughter)

Examiner: What situations would you be disorganized in, when would you be told you were disorganized.

Subject E: I don't know. School work and that.] 57

Examiner: Nothing that comes right to mind.

Subject E: No.

Appendix S

QUESTIONNAIRE ON ORGANIZATION SKILLS--ANALYSIS

STEP THREE (Subject E)

Meaning Units Restated as Themes

Subject E

Theme Number	Theme	Stimulus Question
1.	Usually on time but this year isn't as good - finds it hard to be on time in the mornings.	#1
2.	Never late for Phys. Ed. - has a strong positive feeling for Phys. Ed.	
3.	After he is given an assignment (i.e.) in Math, he thinks a bit before working.	#2
4.	In English he usually can't do the assignment and just sits.	
5.	Last year others helped him with the reading in English - then it's not too bad.	
6.	Hates asking teachers for assistance in reading as it seems like a request for a privilege.	
7.	Agrees it would be better if someone else asked.	
8.	Has asked for help this year even though it was hard but in the past his teachers only knew if someone else told them.	
9.	Has had a buddy in the past.	
10.	Hates the beginning of school as it brings the risk of being asked to read aloud.	
11.	Things are particularly hard this year as he is in a second year of Grade 12 taking Grade 10 courses.	
12.	Subject wishes his Dad saw things the same way as the researcher.	
13.	Finds the situation a bit frustrating.	

14. Wishes those who make fun of him could go through the problem for a couple of days.

15. Describes the difficulties faced as an awful feeling.

16. Sometimes just sits after an assignment is given. #2 repeated

17. If he doesn't know how to do the assignment he doesn't hand it in.

18. Takes the assignment with him when he leaves even though that seems dumb.

19. Doesn't inspect his work as he goes along.

20. Just gets it down and then goes through or gives it to someone else to go through.

21. Tries to start work immediately but would wait a bit if reading were involved. #4

22. Would look at the book and try to read it but if he gets lost he stops.

23. Whether or not he compares the results of his work with the assignment depends on the subject: he does in Math, doesn't in Algebra and sometimes does in English. #5

24. Goes back to correct errors. #6

25. Doesn't always notice errors, especially Spelling errors.

26. Looks for errors by going over and over the assignment.

27. Room can get pretty bad at home but likes keeping clean. #7

28. Has a great deal of difficulty keeping his notes orderly as they don't make sense to him.

29. Phys. Ed. material is always neat.

30. Agrees that tidiness in his personal belongings is dependent on the circumstances.

31. Looks back at the questions as he works. #8

32. Sometimes plans out assignments such as essays. #9

33. Doesn't plan out a paragraph.

34. Doesn't work out alternate solutions to problems. #10

35. In some subjects, such as Math, he doesn't check for errors if his answer seems good. #11

36. Goes over questions more than once in English looking up some answers to see if they are right.

37. Rewrites his work because of all the "red ink". #12

38. Completely rewrites such an assignment.

39. In Math he is neat and just erases part of the question.

40. Mostly he has the necessary materials at hand but not always. #13

41. Sometimes feels directed in an assignment but sometimes (usually in English) feels he doesn't know what to do. #14

42. When he is lost he asks the teacher for suggestions.

43. If he still doesn't understand he would think back and try to write down what he thought was right.

44. Sees his errors sometimes. #15

45. Most likely to see them in Math.

46. Method for locating errors is to read it over.

47. Makes corrections as he works in Math and sometimes in English. #16

48. He doesn't proofread assignments, he gets his mother to. #17

49. Assignments not handed in in class are polished. #18

50. He can't finish in class assignments most of the time and so doesn't hand them in - finds teachers can't read them anyway.

51. School work is his first priority. #19

52. Does the easiest subjects first, leaving English until last.

53. Might daydream, attempt to work until stalled or leave a question when working through an assignment. #20

54. Agrees that being upset would govern his actions.

55. Used to daydream in English class.

56. Feels he is organized. #21

57. Has been told he is disorganized in schoolwork.

Appendix T

QUESTIONNAIRE ON ORGANIZATIONAL SKILLS--ANALYSIS

STEPS TEN THROUGH FOURTEEN (Subject E)

Subject E

Skills			Quantification		
General Organization					
Question	1:	Usually (spontaneous example)	2		
	7:	Situation dependent (example)	2	6/9	(.67)
	13:	Most of the time - sometimes not	2		
Planning					
Question	2:	Situation dependent (spontaneous example)	2		
	9:	Sometimes (spontaneous example)	2	9/12	(.75)
	14:	Sometimes (example)	2		
	19:	Affirmative example	3		
Inspection					
Question	3:	No (spontaneous example)	1		
	8:	Yes (spontaneous example)	3	6/9	(.67)
	15:	Sometimes (example)	2		
Regulation					
Question	4:	Sometimes (example)	2		
	10:	Not really	1		
	16:	Yes - then situation dependent (spontaneous example)	2	7/12	(.58)
	20:	Situation dependent (spontaneous example)	2		
Verification					
Question	5:	Yes and No - situation dependent (spontaneous example)	2		
	11:	No - then situation dependent (spontaneous example)	2	5/9	(.56)
	17:	No (spontaneous example)	1		

Correction

Question 6:	Affirmative	3		
12:	Affirmative (spontaneous example)	3	8/9	(.89)
18:	Sometimes (spontaneous example)	2		

Subject E - Summary

General Organization	.67	
Planning	.75	
Inspection	.67	
Regulation	.58	
Verification	.56	(lowest)
Correction	.89	(highest)

Appendix U

QUESTIONNAIRE ON ORGANIZATIONAL SKILLS--
ANALYSIS STEPS SIXTEEN AND SEVENTEEN (Subject E)

Note: Bracketed verbalizations separate meaning units. Each meaning unit is numbered in the right hand column at its conclusion. Stimulus Questions are underlined. Verbalizations are classified as words, comments, or elaborations and are further classified as precise or general. If the verbalizations are not spontaneous, the words "agree", "disagree" or "parrot" have been added to the descriptor.

Verbatim Transcript--Verbalizations Classified

Stimulus Question		Subject E-- Transcript	Meaning Unit Number
#1	Examiner:	Now, I'm going to ask you some more questions. Are you on time for class?	
	Subject E:	[Try to - sometimes - most of the time. Well, this year's been bad - about being on time. Usually I'm pretty good, except in the mornings.	
	Examiner:	Is that because you find it hard to crawl out?	
	Subject E:	Yeah. Mornings are pretty rough]. [Comment (general)]	1
	Examiner:	Does it have anything to do with the subjects you're taking too? If you like the class - you're likely to be on time?	
	Subject E:	[Yeah, more likely. Like Phys. Ed. (mumble). I'm never late and then I	

feel bad if I'm late. Last year I never missed a class in Phys. Ed. through the whole year.

Examiner: That's good.

Subject E: I just - Phys. Ed - I feel bad if I miss a class. Even for illness, I feel bad, I don't feel good. **[Elaboration (precise)]**

Examiner: That's a real love for you isn't it? You really like it.

Subject E: Yeah. Yeah.] **[Word (agree)]** 2

#2 Examiner: What do you do after the teacher first tells you what to do in an assignment? What do you do? The teacher's at the front of the class: she gives - he gives an assignment. What do you do? Picture yourself - and it might be different for different classes, so feel free to tell me that. Picture yourself in a class and the teacher gives you an assignment - and then - tell me basically what you do.

Subject E: [Think about it a bit.

Examiner: K.

Subject E: And then find - like if it's Math -
look up the page and all that - start
tryin' to do it.] **[Elaboration(general)]** 3
[If it's a English or a reading
assignment - I try to do it and it
usually doesn't work out so I sit
there] **[Comment (general)]** - [but 4
last year or the year before it
wasn't so bad 'cause I got other
students to help me read and (mumble)
it was pretty bad.] **[Comment (general)]** 5

Examiner: Did the teacher suggest that you get other people to help you to read or is that something..

Subject E: Sometimes. Sometimes.

Examiner: So does that depend on the teacher:

Subject E: Yeah. [I don't like asking, going up and asking - you know.

Examiner: Yeah.

Subject E: "I can't read. Can someone else read to me?" I hate doing it. 'Cause I don't know. I don't feel - seems like - to me - I feel like I'm sucking up to them.

Examiner: Yeah.

Subject E: It's just - I don't feel good asking. I don't feel like going - going out of my way. It's stupid. My mom's told me it's stupid and Mrs. ____ (resource teacher) told me it's stupid, you know, but I don't feel good about going up to a teacher that I never met before, and saying, Hey, look it, I can't read very good, I got a reading problem. Like I'm asking if, to me it feels like I'm asking for special privileges.] 6
[Elaboration (precise)]

Examiner: Uhm, mm. Would it be easier for you if someone else did that for you like Mrs. ____ (resource teacher) or someone else?

Subject E: [It's easier that way.] [Comment (general)] [Then I don't think - but - then I don't feel like doing it. I did this year, it was hard - it was real hard. I went to my Chem and biology teacher and I told him - it was really hard to do. I didn't like it. [Elaboration (general)] 7

Examiner: Yeah, I can understand that.

Subject E: I never used to ever tell my teachers. They'd find out someway or they'd never find out.

Examiner: Yeah.

Subject E: But I never go and tell them.'Cause I just - this year I just though - well - I'll have to go ask.] (Elaboration (precise)] 8

Examiner: If someone else did that telling for you, and there could be someone who was sort of, like if you had a friend in the class that you'd arrange that with so you do it subtly, it would be easier wouldn't it?

Subject E: [Yeah. Much easier.[Comment (precise)]

Examiner: Sort of a buddy, like in swimming.

Subject E: They've done it - that's happened before.] [Comment (general)] 9

Examiner: But, is it always sort of a new start, like every new class, every - you got to go over it and over it.

Subject E: [I hate the starting of school, because, you know, when you start school, you don't know them, they don't know you and that and unless they know you if there's some reading that they're doing out loud. It always fails that I always get asked and I hate it. Ah - I just - I get cold chills up my back - I just hate it. 'Cause I feel such - such a dummy and I think about all those other guys thinkin', "what's this guy doin'?"] [Elaboration (precise)] 10
[This year 'specially, because I've been taking Grade 10 courses and I'm in second year Grade 12 - just don't feel good - I didn't like it.] 11
[Elaboration (precise)]

Examiner: Well, I think it's pretty courageous of you, because you're doing it aren't you, because you want to go ahead and take some courses in PHys. Ed. so you're sort of jumping in the deep end. I think it's really good that you're doing it.

Subject E: [I wish you could say that to my Dad, when my report card goes back!] 12
[Comment (precise)]

Examiner: Well, you know, the thing about having reading difficulty is that, you know, it's the same thing, you wouldn't think of trying to get along without your glasses, I mean, you wouldn't! And when you have a reading difficulty and there are certain things that you need to assist you so that your intelligence can work. But it's really difficult sometimes to get those things, I know.

Subject E: [I find it a bit frustrating.] **[Comment (general)]** 13

Examiner: One of the things that sometimes helps it, too, is if you can find somebody else - I'm sure there are other people in the school who know exactly the way you do and are in exactly the same boat, but you don't know who they are and they don't know who you are. And, just sort of, if you know one or two people and you could share your frustrations, it would be a little easier, like it's one thing to talk to - someone who doesn't understand, I mean other people understand, but nobody understands it the way you do.

Subject E: [And I just wish some people - you know - I've said that to a good friend of mine - I wish he could just go a day like I have to. I just wish that sometimes. When people make fun of me I wish they'd go through it a couple days of it, like how I am.] **[Elaboration (precise)]** 14

Examiner: I do that to teachers. I have constructed a number of pages that it's impossible for them to read. And I make them stand up in front of other teachers in workshops and try to read it. And I make fun of them. And, you know, it's maybe not such a nice thing to do, but they have a whole different feeing when they leave.

Subject E: [It's an awful feeling. **[Comment (general)]**

Examiner: And they tell me that will, you know, that have a different understanding of what it's like too. Another thing that I always say to them is, Now, were you any less intelligent when you were reading than you were before or you are now? And they say, No. And I say, You just remember that, because it's not got anything to do with a person's intelligence. It seems people have to, when you say to go through it for a day or so, people have to do it.

Subject E: It's really awful.] **[Comment (general)]** 15

Examiner: One of the things that Oh I'm getting off the topic - really. I've got a couple of different fellows that I worked with in high school in Saskatoon and they come around with me and we did some workshops for teachers and it just helps them to understand bit. And once they understand I - like you found there are some teachers that are really - really helpful and others - it's not that they mean to be cruel, it's just that they don't understand.

Subject E: Yeah. **[Word (agree)]**

Examiner: This beginning to be a..

(Laughter)

Examiner: And you're the one that's supposed to be talking. I've lost my place completely here. Were we back to

#2 repeated what you do after the teacher tells you to do an assignment, wasn't that where we started?

Subject E: We did that.

Examiner: Yes, and what you do. And you said that you were saying that sometimes you just sit.

Subject E: Yeah. **[Word]**

Examiner: Rather than going through the embarrassment of trying to ask somebody to read for you.

Subject E: Yeah. I'll do that. I did that a lot.][Comment (general)] 16

Examiner: So then what happens when you have the assignment to do? Does the teacher get angry?

Subject E: [I don't usually hand it in.] [Comment (general)] 17

Examiner: Yeah.

Subject E: [I usually just take it. It's abit dumb I guess but - I don't know...It's hard to describe.] [Elaboration (general)] 18

Examiner: Well, it's a difficult situation to be in, like you said, you went through when you talk to your teachers this time around.

Subject E: Uhm.

Examiner: I can understand. It's a different thing when you're with the same people and there's someone you could follow through and you don't have to
#3 keep repeating it. Do you inspect your work as you go along?

Subject E: Don't know.[Comment (general)]

Examiner: Inspect it, like, do you..

Subject E: [Not usually.] [Comment (precise) (disagree)][I usually just get it all down. 19

Examiner: Uh, hum.

Subject E: And then go through it or else I have to get someone else to go through it.][Comment (general)] 20

#4 Examiner: Do you start a task immediately?

Subject E: [Uhh, sometimes. Try to. **[Comment (general)]**

Examiner: What would be cases where you would and you wouldn't?

Subject E: Uh, with reading I probably would wait a bit.] **[Comment (general)]** 21

Examiner: All right.

Subject E: [Mm - I'd look at the book - If the book seemed - I'd start tryin' to read it and that - if I get so far; if I just didn't understand it. I get lost if I drop it or stop it. I've done that, and in math I usually I try to get right on it.] **[Elaboration (precise)]** 22

#5 Examiner: Do you compare the results of the work with what you're supposed to do, like when you get all done, to see what you have or done what the teacher told you to do? Do you do that?

Subject E: [Ah, yeah, and no. In Math I do, but in Algebra, no I don't. And in English, sometimes.] **[Elaboration (precise)]** 23

#6 Examiner: Do you make corrections that you notice by yourself, like, if you see something and you know it's wrong, do you go back and correct it? Or do you tend to leave it?

Subject E: [In my own work?

Examiner: Uhm, hum.

Subject E: Yeah, I'll go back and correct it.] **[Comment (precise)]** 24

Examiner: Do you tend to notice errors?

Subject E: [Sometimes, like something's (mumble) sometimes not - not spelling errors I don't notice them - like some people do.] **[Elaboration (precise)]** 25

Examiner: Do you use a method for going back and looking for things that are wrong?

Subject E: Do I use a method? [Question]

Examiner: Yes.

Subject E: [No. I just usually go over and over
it.] [Comment (general)] 26

Examiner: O.K. That's a method.

Subject E: Oh.

(Laughter)

Examiner: So you sort of start at the beginning
#7 and just read it through. Would you say that you're tidy about your personal belongings?

Subject E: My personal belongings? How do you mean? [Question]

Examiner: Well, if I looked into your room. Would I faint?

(Laughter)

Subject E: [Sometimes, it gets pretty bad. I
don't know I - It just depends. I
like keeping clean,] [Elaboration 27
(general)] [my notebooks are usually
so messy 'cause notes. I can't keep
them in order - it doesn't - in order
because they don't make sense
anyways. It's usually just thrown in
there.] [Elaboration(precise)] [My 28
Phys. Ed. stuff, I'm usually pretty
neat about that. See, Phys. Ed.
locker is always neat. I don't know] 29
[Elaboration (precise)]

Examiner: So it sort of depends.

Subject E: [Yeah.] [Word] 30

#8 Examiner: Do you integrate earlier aspects of something you are doing by checking back as you work. Say, if you're writing a paper, would you look back as you're working to make sure that you are doing the right then is connected?

Subject E: [Yes, I look back at the questions. Yeah.] **[Comment (precise)]** 31

#9 Examiner: Do you make a plan for an assignment?

Subject E: Hum.

Examiner: Or do you jump right in?

Subject E: [Sometimes I make a plan, of what I want to say.

Examiner: What kind of assignment would you tend to make a plan in?

Subject E: An essay. An - sometimes, writing a paper.] **[Comment (general)]** 32 [Like when they say write a paragraph about it, I just get right down..] 33 **[Elaboration (general)]**

#10 Examiner: Do you work out alternate solutions to problems, like if you know there's more than one way to do it you sort of think about that and then choose one way or do you tend to feel quite sure of the answer to do it another way?

Subject E: [Not really.] **[Comment (general) (disagree)]** 34

#11 Examiner: O.K. Do you check for errors when you're finished an assignment?

Subject E: [No. If I get through it and get a good answer - usually - no. I hope it's the right one. Sometimes - it's like it's a..**[Elaboration(general)]**

Examiner: What subjects are you talking about?

Subject E: Math usually one I get the answer. I think that's the answer.] **[Comment (general)]** 35 [But English sometimes I'll go over the question again and look up my answers and see if it's right.] **[Elaboration (precise)]** 36

Examiner: O.K. Do you work out - oh I asked you that, and I'm not going to ask

#12 you again. Do you rewrite an original draft, say, you write something out once, then do you write it out again?

Subject E: [Yeah, I always have to. So much red ink on it that I have to.] [Comment (precise)] 37

Examiner: And when you do something like that do you just sort of totally rewrite it starting from the beginning and write it all over again or do you erase some parts?

Subject E: [Yeah. Rewrite it over on a new piece of paper.] [Comment (precise) (parrot)] 38

Examiner: How about math, how would you do that?

Subject E: [Uhm, math, actually sometimes I'm neat in Math, then I'll just erase.[Comment (precise)(parrot)]

Examiner: That part?

Subject E: Yeah. I don't usually try to do it in pencil.] [Comment (precise)] 39

#13 Examiner: Do you have on hand the necessary materials that you need to do an assignment like your pen, your notebook, your eraser and that kind of thing, or do you have to "psst hey! Can I borrow..?"

Subject E: [Sometimes. Most of the time I have it. Sometimes I don't though.] [Comment (general)] 40

#14 Examiner: Do you feel directed or like you know where you're going when you do an assignment?

Subject E: [Sometimes, and sometimes I don't. I don't know what to do. Where to go.

Examiner: Sometimes you feel lost.

Subject E: Yeah. In English I usually feel lost.] **[Comment (precise)]** 41

Examiner: What do you do when you're lost?

Subject E: I don't know. [Uh, panic - no, not again ah, - ask the teacher for suggestions - what he means.] **[Comment (precise)]** 42

Examiner: O.K. And if the first answer isn't good, would you ask another one? If you still can't get hold of it?

Subject E: Yeah. Still don't know what ya mean.**[Comment (general)]**

Examiner: O.K. And then what would you do?

Subject E: If I'm still lost? **[Queston]**

Examiner: Uhm hum.

Subject E: [I don't know. Trying to think back. Write down what I thought and - I don't know.] **[Elaboration (general)]** 43

#15 Examiner: O.K. Do you see errors as you work through an assignment? Do you see your errors as you're working?

Subject E: [Umm. Sometimes, not all the time.] **[Comment (general)]** 44

Examiner: Where would you be likely to see them?

Subject E: [In Math.] **[Comment (precise)]** 45

Examiner: Do you have a method for looking for errors?

Subject E: [Just read them - redo them - the question. (mumble) I'd go over it again.] **[Elaboration (precise)]** 46

#16 Examiner: Do you tend to make corrections as you work?

Subject E: [Yeah, in Math, yeah.

Examiner: In Math.

Subject E: Sometimes in English too.] [Comment (general) 47

#17 Examiner: Do you proofread your written assignments?

Subject E: No, no, I don't. I usually get my Mom to.] [Comment (precise)] 48

#18 Examiner: Would you say that you tend to hand in a polished product? When you hand something in, do you feel it's really quite nice? Would you say it's well done?

Subject E: [Sometimes, if I don't have to hand it in, like that class, if I can have a day or two to work on it, it's usually polished.] [Comment (precise)] 49 [But if it's to be done in the class then usually most of the times I won't get it in because it won't be finished and he can't - teacher wouldn't be able to read it anyway.] [Elaboration (precise)] 50

#19 Examiner: O.K. Do you set priorities when you have a series of things to do, like in a class or for homework, do you set priorities? That means have something to do before something else?

Subject E: [Yeah. [Word (agree)]

Examiner: O.K. How do you do that?

Subject E: Uhm.

Examiner: What do you base that on?

Subject E: I always have to have all my school work done before I can do anything else.] [Comment (precise)] 51

Examiner: O.K.

Subject E: Usually, sometimes but not.. [Comment (general)]

Examiner: Within your school work, what - how would you set your priorities?

Subject E: Homework. **[Word (precise)]**

Examiner: Yeah.

Subject E: Have it done then I can go... **[Comment (general)]**

Examiner: What if you have three different subjects to do for homework, how would you set priorities in which work you do first?

Subject E: [Oh, ah - usually the easiest one first. I leave English 'til last.] **[Elaboration (precise)]** 52

#20 Examiner: O.K. Do you carry through to the end of an assignment, unless you run into a legitimate problem, by legitimate problem, I mean - like you couldn't read the question, or like you get stuck in a method, or do you sometimes tend to daydream or just leave that? Do you tend to..

Subject E: [Both. Sometimes daydream, sometimes I go ahead until I can't do it, sometimes just leave the question, or leave it out.] **[Elaboration (general) (partially parroted)]** 53

Examiner: What would make you tend to one or the other of those things?

Subject E: [Uh - What would - Let me think now - something happening - somethings happened. **[Comment (general)]**

Examiner: Yeah and you were upset about something you mean..

Subject E: Yeah.] **[Word (agree)]** 54

Examiner: Would the subject have anything to do with it?

Subject E: [Sometimes English, I used to daydream a lot.] **[Comment (precise)]** 55

#21 Examiner: Do you see yourself as an organized person or a disorganized person?

Subject E: [Organized.] [Word (precise)(parrot)] 56

Examiner: O.K.

Subject E: [Sometimes disorganized - I've been told. [Comment (general)]

(Laughter)

Examiner: What situations would you be disorganized in, when would you be told you were disorganized.

Subject E: I don't know. School work and that.] 57
Comment (general)]

Examiner: Nothing that comes right to mind.

Subject E: No.

Appendix V

QUESTIONNAIRE ON ORGANIZATIONAL SKILLS--

SUMMARY OF ANALYSIS STEPS SIXTEEN AND SEVENTEEN

(Subject E)

Key:
C: Comment
E: Elaboration
G: General
P: Precise

Meaning Unit	Descriptor (16)	Descriptor (17)
1	C(G)	
2	E(P)	
	W	agree
3	E(G)	
4	C(G)	
5	C(G)	
	W	agree
	W	agree
	C(G)	
6	E(P)	
	E(P)	
7	C(G)	
8	E(G)	
	C(P)	
	E(P)	
9	C(P)	

	C(G)	
10	E(P)	
11	E(P)	
12	C(P)	
13	C(G)	
14	E(P)	
15	C(G)	
	C(G)	
16	W	
17	C(G)	
18	E(G)	
	C(G)	
19	C(P)	disagree
20	C(G)	
21	C(G)	
22	E(P)	
23	E(P)	
24	Q	
	C(P)	
25	E(P)	
	Q	
	W	
	W	
26	C(G)	
	Q	
27	E(G)	

28	E(P)	
29	E(P)	
30	W	
31	C(P)	
32	C(G)	
33	E(G)	
34	C(G)	disagree
35	E(G)	
	C(G)	
36	E(P)	
37	C(P)	
38	C(P)	
39	C(P)	
	C(P)	
40	C(G)	
41	C(G)	
42	C(P)	
	C(G)	
	Q	
43	E(G)	
44	C(G)	
45	C(P)	
46	E(P)	
47	C(G)	
48	C(P)	
49	C(P)	

50	E(P)	
51	W	agree
	C(P)	
	C(G)	
	W(P)	
	C(G)	
52	E(P)	
53	E(G)	parrot (in part)
54	C(G)	
	W	agree
55	C(P)	
56	W(P)	parrot
57	C(G)	
58	C(G)	

Total Descriptors Step 16 = 82

Total Descriptors Step 17 = 11

Total Words

Single Words	9	(5 of which were agree/disagree/parrot)
Precise Words	2	(1 of which was parroted)

Total Comments

General	25	(1 of which was a disagreement)
Precise	18	(3 of which were agree/disagree/parrot)

Total Elaborations

General	8	(1 of which was parroted)
Precise	16	
Total Questions		
Questions	4	

Appendix W

INTERVIEW REGARDING STUDY HABITS--
ANALYSIS STEP ONE (Subject E)

In the pages that follow, the full transcripts for Subject E's responses to the **Interview Regarding Study Skills** is reproduced. While the analysis of this data may be found in Chapter V, the data reduction and labelling processes may be more clearly understood by referring to this and the following Appendices while reading the text of the study. Appendices W, X, Y and Z reveal greater detail regarding the analysis procedures.

Verbatim Transcript

Subject E Transcript

Examiner: Now, I am going to ask you some questions, generally about how you study, how you learn, and those kinds of questions. If you remember that's what I was looking at. And, so it's important that you tell me not what you think you should do, but what you really do do. There are no right or wrong answers, because I am studying what people do. Sometimes it may be hard for you to tell me what you do because it may be something that you haven't thought about before so feel free to take a few minutes and think about it. Also, sometimes you'll think I'm asking you exactly the same thing all over again, and indeed I may be, and so you can just tell me the same thing over again, or if you think of anything more to add you can do that. O.K.?

Subject E: O.K.

Examiner: Remember when we first started this study I told you that I had chosen you because I had looked through the files and I'd found people who had good intelligence, but who'd had some problem along the way. What did you think when I told you that you had good intelligence, what did you think about that?

Subject E: It felt good. Because I had been told before that I had a high IQ.

Examiner: Uh huh.

Subject E: And that felt good.

Examiner: That's good.

Subject E: That it's not just I'm stupid.

Examiner: So that - somebody did tell you that before?

Subject E: Yeah.

Examiner: Who told you that?

Subject E: Uh, my Mom, I think. Mr. ________ told my Mom about the studies that we did at the School Board I went there for three or four days.

Examiner: I see.

Subject E: They told them that.

Examiner: O.K. So that would be when you were - well probably somewhere between grade 3 and grade 6, or in there somewhere.

Subject E: Yeah. Four or five.

Examiner: O.K.

Subject E: Think it was five, Grade five.

Examiner: But you had difficulty in school, right?

Examiner: Uhm hum.

Examiner: Why do you think you had difficulty in school?

Examiner: I don't know. The reading - it was so hard for me to read and at first I didn't understand why - it was so hard. I never knew I had a reading problem, I just thought it was so hard to do.

Examiner: Uhm hm.

Subject E: That everyone had this problem.

Examiner: Uhm hm.

Subject E: I think in Elementary it was - I was a real hyper kid. I still am. I couldn't sit still. I can't sit still for a long time - ah.

Examiner: So that made it even harder.

Subject E: Yeah. Even now, it's hard to sit up straight, I gotta move. I can't sit still.

Examiner: So, any class that is fairly formal and goes on for a long tim~~e - it~~'s still difficult for you?

Subject E: Uhm hum. Yeah. Very. I just gotta move. I dunno - some teachers probably..

Examiner: If they don't understand that it's how you feel - that you just have to - rather than your doing it to get on their nerves.

Subject E: Yeah. Yeah.

Examiner: Are some subjects harder than others? Do you think?

Subject E: English is really hard. I was never any good at English - Math used to be good, I don't know what happened, I used to be good in Math. Now - I got lost in Grade 10. Ah - we were doing Trig at the start of the year, and I just got lost. And this is first year back for me. I took Maths - it's not too bad. In grade 8 and there in elementary, I was really good in Math. Like 'cause there was no reading to do, and now there's a bit of reading that you do. So ..

Examiner: So, you think part of your Math problem is just a matter of trying to figure out what to do and question ..

Subject E: Yeah. Phys Ed. is real easy. I have no problems in that. That's my best subject (mumble) never had any problems in Phys. Ed. Spelling - I hate Spelling. I hated those spelling tests oh with so much passion 'cause I always had to end up writing the whole test almost - 20 times or whatever we had to do. I always had to - had to do that. I hated that - those things. I wish that - there were no more Spelling tests.

Examiner: And it happened once a week, didn't it? Without fail.

Subject E: Yeah. Yeah. I'd - if I had to change something I'd change that. I wouldn't make people write spelling tests.

Examiner: So if you're ever put in charge of schools for a week or so, nobody will have to spell?

Subject E: No one spell - no spelling tests.

Examiner: Losts of people probably would like that.

Subject E: 'Cause the way that I used to memorize was - write it over and over and over and over. That's how I used to - that helps a bit - sometimes it doesn't.

Examiner: Yeah. When you think - fold the paper over - like I mentioned last time at least quite a few of the university students I've given that hint to have come back to me and said it helps particularly in the sciences and that kind of thing.

Subject E: O.K.

Examiner: I have spent quite a bit of time talking with university students that have problems.

Subject E: Um hum.

Examiner: Usually what we do is we work together for awhile and we try something and see if it works, and then we go to something else but ..

Subject E: Um hum.

Examiner: That's very interesting, that's what I'm interested in studying. That's one I give you with a fair amount of confidence. That if you write the words out - everything doesn't work for everybody. You have to give it a fair trial.

Subject E: Yeah.

Examiner: Why do you think some people do well in school?

Subject E: Do well?

Examiner: Yeah. Some people do well and other people just ..

Subject E: It just comes to them.

Examiner: O.K.

Subject E: Like my brother, he's really good in school - my younger brother. That - that used to be hard cause he'd be readin' books ..

Examiner: Yeah.

Subject E: And you know I just - ah - I don't know - it just - it just comes to him.

Examiner: You say your brother is twelve or thirteen?

Examiner: Yeah. Twelve maybe thirteen. He's just in Grade 7 and a little guy.

Examiner: Yeah. O.K. You said things just sort of come to them. Is there any other reason why people do well in school?

Subject E: They're just naturally smart I guess. It's easy for them. I don't know.

Examiner: What do you do when you're left pretty well on your own to do an assignment, say, like writing an essay? Can you describe to me what you would do?

Subject E: Panic!

Examiner: You don't know how much pleasure your tapes gave me over the summer - your little jokes you - I was sitting in my room for hours transcribing all that on paper - then I'd come to yours and there were always jokes.

Subject E: I usually- I haven't done an essay for so long. I usually got help - my Mom would help me, she'd help me out. We'd go find books and then find what the topic in the books and then write down - the information then go from that and write it down in words and so - her words too. She'd help me that way. I usually tried to start it early cause I needed all the time I could get on it - still I'd come right down to the wire - hand it in.

Examiner: Uhm hum.

Subject E: I used to like essays - doin' essays 'cause I usually got real good marks - good marks. On essays I always got good marks.

Examiner: That's good. That's very good. O.K. If you need to know a piece of information for a paper you are writing how do you go about finding it? Say, you're given a paper on a certain topic, how do you go about finding that information?

Subject E: Uh ..

Examiner: It's not in your head. How do you get it?

Subject E: Usually, usually - go look up books, get the information, look in the dictionary or the - what you call it - encyclopedia.

Examiner: Mhmm. Can you tell me why you use an encylopedia, how you use it to find information?

Subject E: Uhm, when you get the topic that you want and you look it up, like in a dictionary, the topic.

Examiner: Uhm hum. Say it's radios, what would you look up?

Subject E: I look up under radio go and get the book "R" ..

Examiner: O.K.

Subject E: And look for radio - know how it's spelt.

Examiner: O.K.

Subject E: And - I would take the information from that, and then I'd go to a book and ..

Examiner: How do you take the information?

Subject E: Usually I just write it all out, or else sometimes I xerox. And then you would find some books on radios to read in the library in the section on radios and take out a - a bunch of books (pause) to look through. What helps me a lot is the pictures. It helps me - that's how I get a lot of information is from pictures.

Examiner: So do you use the pictures both to find where the information is and to get information from?

Subject E: Yeah.

Examiner: Anything else you do?

Subject E: I use a lot of pictures in my reports.

Examiner: In the reports as well, rather than writing sections, or to ..

Subject E: Or to illustrate.

Examiner: Illustrate. O.K. They say a picture is worth a thousand words. Suppose the teacher asks you to read a chapter in a book on a certain topic. How - what would you do? Describe what you would do?

Subject E: How to write a chapter?

Examiner: No, read a chapter.

Subject E: Oh, read a chapter.

Examiner: Uh, huh. He just gives you the topic. How would you go about doing that?

Subject E: They wouldn't tell you the book?

Examiner: Yeah, tell you the book and they want you to find the information in that book, on uh, snails.

Subject E: Look in the back under snails and find out what page it would be on.

Examiner: O.K. Anything else you could do?

Subject E: Uh, sometimes I'd thumb through until I saw a picture of a snail that's usually - a lot of the times what I do and then go from there. Sort of read - kinda read.

Examiner: So, when you said using the index, is that what you thought I wanted you to say and when you said you'd look through the pictures that's what you would do, remember telling what you would do.

Subject E: Sometimes I do it. Not most of the time.

Examiner: Remember when - I had a task that I asked you to do that; I gave you a book and I said, use this book to find information on ... Do you feel that in school you have been taught to use the index and table of contents and is that something that is ..?

Subject E: Not really.

Examiner: You don't feel ..

Subject E: I don't - not really. I usually just take it and thumb through it.

Examiner: What about workbooks? Do you remember having to put things in alphabetical order and which would come first in the index and that kind of thing. Do you remember doing that in your workbooks?

Subject E: No.

Examiner: O.K. - O.K. Now, this is going to be - if this was next week this wouldn't be a hypothetical question. Suppose you have an exam tomorrow. Tell me what you would do to prepare for the exam.

Subject E: Oh - last couple of years? I wouldn't do nothing. I'd hardly do anything. Because I usually get so nervous, always so flustered trying to find it. Review everything - that - the last two years I haven't done anything. I don't know if I've been passin'. Because I usually failed them anyways. But I just haven't done anything and I've felt better, I felt better after I wrote it.

Examiner: Why do you suppose that is? That you felt better when you didn't study?

Subject E: I don't know. It's just - usually I get so nervous, panic and just get the butterflies.

Examiner: Uhm, hum.

Subject E: But after, if I don't bother studying about it, if I think about it - - sometimes it bothers me about not studying but - I'd go in the test you know, then usually I'm calm. I feel better - I don't ..

Examiner: But you said you were preparing for this Biology that's coming up.

Subject E: Biology you have to 'cause I've been doing so bad.

Examiner: Yeah.

Subject E: I just try to go over my notes.

Examiner: What do you mean by going over your notes?

Subject E: Looking over, and reading and sort of skimming over it.

Examiner: Anything else?

Subject E: Try doing some of the assignments again working them out. Look in the text, go through the text, the pictures and everything else.

Examiner: Do you ever talk to yourself?

Subject E: Yeah.

Examiner: How do you do that?

Subject E: I usually read something and repeat it. I don't know.

Examiner: Anything else that you do? Do you ever write?

Subject E: Ah, writing is I don't know - to get the spelling down right. I think too much about it - have to concentrate. That's why it's hard for me to take notes. I can not - this year I haven't taken very many notes. Because I'm still concentrating on the - I've missed all what he's said. I'm usually so far behind. So I just sat back and listened and I get a friend's notes.

Examiner: I see, yeah - have you ever tried taping?

Subject E: Taping at class? I used to tape but I haven't - I haven't taped this year at all.

Examiner: When did you tape?

Subject E: It was in Grade 10 - it was I taped. A bit of Grade 11 - I don't know - I felt - I don't know - running the tape recorder and I felt - ah ..

Examiner: Yeah. That's an interesting part to doing it. A lot of people feel a little nervous about that at first.

Subject E: Um hum.

Examiner: A lot of university students say that unless they do that they're not going to make it. There's some little ones now. They're so tiny.

Subject E: Yeah, I used to have one of those it was about that big. I don't know - I've lost it somewhere, I don't know where I've -

Examiner: Yeah. I think it's easier at the university and it's much easier in the States than it is in Canada actually because in the States it's quite common. In fact I did a year's study in Chicago before I came here and I found the American way of speaking so rapid that I couldn't take notes and I've usually been pretty good at taking notes but I just couldn't keep up to - that's what it sounded like to me. The thing that's difficult about doing that, of course, was then going home with the tape and try to make notes from that as I did that's really time-consuming. Some people just listen to it over again but I found that I had to do that - to make the kind of notes that I wanted to make because I just couldn't keep up if I couldn't make notes. But I didn't feel too conspicuous about that because there were other people doing it as well.

Subject E: I think it would be better if there were other people doing it, you see I'm the only person I'm sure in school that would do that. I just didn't feel right.

Examiner: I'm sure other people would benefit from it if they just knew about it. But it's something that a lot of people don't know about either. But I can understand your hesitancy to do it, because it kind of makes you stand out.

Subject E: I thought if other people would do it - I just don't know.

Examiner: Yeah. I guess it's a point where doing it is more important than - you know, what other people think and that's to balance your strike for yourself, at sometime.

Subject E: That's true.

Examiner: O.K. But I understand that. I can understand.

Appendix X

INTERVIEW REGARDING STUDY HABITS - ANALYSIS STEP TWO (Subject E)

Note: Bracketed verbalizatons separate meaning units. Each meaning unit is numbered in the right hand column at its conclusion. Stimulus Questions are underlined.

Verbatim Transcript Divided into Meaning Units

Stimulus Question	Subject E--Transcript		Meaning Unit Number
	Examiner:	Now, I am going to ask you some questions, generally about how you study, how you learn, and those kinds of questions. If you remember that's what I was looking at. And, so it's important that you tell me not what you think you should do, but what you really do do. There are no right or wrong answers, because I am studying what people do. Sometimes it may be hard for you to tell me what you do because it may be something that you haven't thought about before so feel free to take a few minutes and think about it. Also, sometimes you'll think I'm asking you exactly the same thing all over again, and indeed I may be, and so you can just tell me the same thing over again, or if you think of anything more to add you can do that. O.K.?	
	Subject E:	O.K.	
	Examiner:	Remember when we first started this study I told you that I had chosen you because I had looked through the files and I'd found people who had good intelligence, but who'd had some	

#1 problem along the way. What did you think when I told you that you had good intelligence, what did you think about that?

Subject E: [It felt good. Because I had been told before that I had a high IQ.

Examiner: Uh huh.

Subject E: And that felt good.] 1

Examiner: That's good.

Subject E: [That it's not just I'm stupid.] 2

#2 Examiner: So that - somebody did tell you that before?

Subject E: Yeah.

#2a Examiner: Who told you that?

Subject E: [Uh, my Mom, I think. Mr. ________ told my Mom about the studies that we did at the School Board I went there for three or four days.

Examiner: I see.

Subject E: They told them that.

Examiner: O.K. So that would be when you were - well probably somewhere between grade 3 and grade 6, or in there somewhere.

Subject E: Yeah. Four or five.

Examiner: O.K.

Subject E: Think it was five, Grade five.] 3

Examiner: But you had difficulty in school, right?

Subject E: Uhm hum.

#3 Examiner: Why do you think you had difficulty in school?

Subject E: [I don't know. The reading - it was

so hard for me to read and at first I
didn't understand why - it was so
hard. I never knew I had a reading
problem, I just thought it was so
hard to do.

Examiner: Uhm hm.

Subject E: That everyone had this problem.

Examiner: Uhm hm.

Subject E: I think in Elementary it was - I was
a real hyper kid. I still am. I
couldn't sit still. I can't sit still
for a long time - ah.] 4

Examiner: So that made it even harder.

Subject E: [Yeah. Even now, it's hard to sit up
straight, I gotta move. I can't sit
still.

Examiner: So, any class that is fairly formal
and goes on for a long time it's
still difficult for you?

Subject E: Uhm hum. Yeah. Very. I just gotta
move.] [I dunno - some teachers 5
probably ..

Examiner: If they don't understand that it's
how you feel - that you just have to
- rather than your doing it to get on
their nerves.

Subject E: Yeah. Yeah.] 6

#4 Examiner: Are some subjects harder than
others? Do you think?

Subject E: [English is really hard.] [I was never 7
any good at English - Math used to be
good, I don't know what happened, I
used to be good in Math. Now - I got
lost in Grade 10. Ah - we were doing
Trig at the start of the year, and I
just got lost. And this is first year
back for me. I took Maths - it's not
too bad. In grade 8 and there in
elementary, I was really good in Math.
Like 'cause there was no reading to

do, and now there's a bit of reading
that you do.] So .. 8

Examiner: So, you think part of your Math problem is just a matter of trying to figure out what to do and question ..

Subject E: Yeah. [Phys Ed. is real easy. I have
no problems in that. That's my best
subject (mumble) never had any
problems in Phys. Ed.] [Spelling - I 9
hate Spelling. I hated those spelling
tests oh with so much passion 'cause I
always had to end up writing the whole
test almost - 20 times or whatever we
had to do. I always had to - had to
do that. I hated that - those things.
I wish that - there were no more
Spelling tests.

Examiner: And it happened once a week, didn't it? Without fail.

Subject E: Yeah. Yeah. I'd - If I had to change something I'd change that. I wouldn't make people write spelling tests.

Examiner: So if you're ever put in charge of schools for a week or so, nobody will have to spell?

Subject E: No one spell - no spelling tests.

Examiner: Losts of people probably would like that.

Subject E: 'Cause the way that I used to memorize
was - write it over and over and over
and over. That's how I used to - that
helps a bit - sometimes it doesn't.] 10

Examiner: Yeah. When you think fold the paper over like I mentioned last time at least quite a few of the university students I've given that hint to have come back to me and said it helps particularly in the sciences and that kind of thing.

Subject E: O.K.

Examiner: I have spent quite a bit of time talking with university students that have problems.

Subject E: Um hum.

Examiner: Usually what we do is we work together for awhile and we try something and see if it works, and then we go to something else but ..

Subject E: Um hum.

Examiner: That's very interesting, that's what I'm interested in studying. That's one I give you with a fair amount of confidence. That if you write the words out - everything doesn't work for everybody. You have to give it a air trial.

Subject E: Yeah.

#5 Examiner: Why do you think some people do well in school?

Subject E: Do well?

Examiner: Yeah. Some people do well and other people just ...

Subject E: [It just comes to them.] 11

Examiner: O.K.

Subject E: [Like my brother, he's really good in school - my younger brother. That - that used to be hard cause he'd be readin' books.

Examiner: Yeah.

Subject E: And you know I just - ah - I don't know - it just - it just comes to him.] 12

Examiner: You say your brother is twelve or thirteen?

Examiner: Yeah. Twelve maybe thirteen. He's just in Grade 7 and a little guy.

Examiner: Yeah. O.K. You said things just sort of come to them. Is there any other reason why people do well in school?

Subject E: [They're just naturally smart I guess. It's easy for them. I don't know.] 11

continued

#6 Examiner: What do you do when you're left pretty well on your own to do an assignment, say, like writing an essay? Can you describe to me what you would do?

Subject E: [Panic!] 13

Examiner: You don't know how much pleasure your tapes gave me over the summer - your little jokes you - I was sitting in my room for hours transcribing all that on paper - then I'd come to yours and there were always jokes.

Subject E: [I usually- I haven't done an essay
for so long.] [I usually got help - 14
my Mom would help me, she'd help me
out. We'd go find books and then find
what the topic in the books and then
write down the information then go
from that and write it down in words
and so - her words too. She'd help me
that way.] [I usually tried to start 15
it early cause I needed all the time
I could get on it - still I'd come
right down to the wire - hand it in.] 16

Examiner: Uhm hum.

Subject E: [I used to like essays - doin essays 'cause I usually got real good marks - good marks. On essays I always got good marks.] 17

Examiner: That's good. That's very good.

#7 O.K. If you need to know a piece of information for a paper you are writing how do you go about finding it? Say, you're given a paper on a certain topic, how do you go about finding that information?

Subject E: Uh ..

Examiner: It's not in your head. How do you get it?

Subject E: [Usually, usually - go look up books,
get the information, look in the
dictionary or the - what you call it
- encyclopedia.] 18

Examiner: Mhmm. Can you tell me why you use an encylopedia, how you use it to find information?

Subject E: Uhm, when you get the topic that you want and you look it up, like in a dictionary, the topic.

Examiner: Uhm hum. Say it's radios, what would you look up?

Subject E: [I look up under radio go and get the book "R" ..

Examiner: O.K.

Subject E: And look for radio - know how it's spelt.

Examiner: O.K.

Subject E: And - I would take the information
from that,] and then I'd go to a 19
book and ..

Examiner: How do you take the information?

Subject E: [Usually I just write it all out, or
else sometimes I xerox.] [And then 20
you would find some books on radios to
read in ~~the~~ library in the section on
radios and take out a - a bunch of
books (pause) to look through.] [What 21
helps me a lot is the pictures. It
helps me - that's how I get a lot of
information is from pictures.] 22

Examiner: So do you use the pictures both to find where the information is and to get information from?

Subject E: Yeah.

Examiner: Anything else you do?

Subject E: [I use a lot of pictures in my reports.

Examiner: In the reports as well, rather than writing sections, or to ..

Subject E: Or to illustrate.] 23

#8 Examiner: Illustrate. O.K. They say a picture is worth a thousand words. Suppose the teacher asks you to read a chapter in a book on a certain topic. How - what would you do? Describe what you would do?

Subject E: How to write a chapter?

Examiner: No, read a chapter.

Subject E: Oh, read a chapter.

Examiner: Uh, huh. He just gives you the topic. How would you go about doing that?

Subject E: They wouldn't tell you the book?

Examiner: Yeah, tell you the book and they want you to find the information in that book, on uh, snails.

Subject E: [Look in the back under snails and find out what page it would be on.] 24

Examiner: O.K. Anything else you could do?

Subject E: [Uh, sometimes I'd thumb through until I saw a picture of a snail that's usually - a lot of the times what I do and then go from there. Sort of read - kinda read.] 25

Examiner: So, when you said using the index, is that what you thought I wanted you to say and when you said you'd look through the pictures that's what you would do, remember telling what you would do.

Subject E: Sometimes I do it. Not most of the time.

Examiner: Remember when - I had a task that I asked you to do that; I gave you a book and I said, use this book to find information on - Do you feel that in school you have been taught to use the index and Table of Contents and stuff is something that is ..

Subject E: [Not really.] 26

Examiner: You don't feel ..

Subject E: [I don't ... not really. I usually just take it and thumb through it.] 27

Examiner: What about workbooks? Do you remember having to put things in alphabetical order and which would come first in the index and that kind of thing. Do you remember doing that in your workbooks?

Subject E: [No.] 28

#9 Examiner: O.K. - O.K. Now, this is going to be - if this was next week this wouldn't be a hypothetical question. Suppose you have an exam tomorrow. Tell me what you would do to prepare for the exam.

Subject E: [Oh - last couple of years? I woudn't do nothing. I'd hardly do anything. Because I usually get so nervous, always so flustered trying to find it. Review everything - that - the last two years I haven't done anything. I don't know if I've been passin'. Because I usually failed them anyways. But I just haven't done anything and I've felt better, I felt better after I wrote it.] 29

Examiner: Why do you suppose that is? That you felt better when you didn't study?

Subject E: [I don't know. It's just - usually I get so nervous, panic and just get the butterflies.

Examiner: Uhm, hum.

Subject E: But after, if I don't bother studying about it, if I think about it - sometimes it bothers me about not studying but - I'd go in the test you know, then usually I'm calm. I feel better. - I don't.] 30

Examiner: But you said you were preparing for this biology that's coming up.

Subject E: Biology you have to 'cause I've been doing so bad.

Examiner: Yeah.

Subject E: [I just try to go over my notes.] 31

Examiner: What do you mean by going over your notes?

Subject E: [Looking over, and reading and sort of skimming over it.

Examiner: Anything else?

Subject E: Try doing some of the assignments again working them out. Look in the text, go through the text, the pictures and everything else.] 32

Examiner: Do you ever talk to yourself?

Subject E: [Yeah.

Examiner: How do you do that?

Subject E: I usually read something and repeat it. I don't know.] 33

Examiner: Anything else that you do? Do you ever write?

Subject E: [Ah, writing is I don't know - to get the spelling down right. I think too much about it - have to concentrate. That's why it's hard for me to take notes. I can not - this year I haven't taken very many notes. Because I'm still concentrating on the - I've missed all what he's said. I'm usually so far behind.] 34

[So I just sat back and listened and I get a friend's notes.] 35

Examiner: I see, yeah - have you ever tried taping?

Subject E: Taping at class? [I used to tape but I haven't - I haven't taped this year at all.

Examiner: When did you tape?

Subject E: It was in Grade 10 - it was I taped. A bit of Grade 11 - I don't know - I felt - I don't know - running the tape recorder and I felt - ah ..] 36

Examiner: Yeah. That's an interesting part to doing it. A lot of people feel a little nervous about that at first.

Subject E: Um hum.

Examiner: A lot of university students say that unless they do that they're not going to make it. There's some little ones now. They're so tiny.

Subject E: Yeah, I used to have one of those it was about that big. I don't know - I've lost it somewhere, I don't know where I've ..

Examiner: Yeah. I think it's easier at the university and it's much easier in the States than it is in Canada actually because in the States it's quite common. In fact I did a year's study in Chicago before I came here and I found the American way of speaking so rapid that I couldn't take notes and I've usually been pretty good at taking notes but I just couldn't keep up to - that's what it sounded like to me. The thing that's difficult about doing that, of course, was then going home with the tape and try to make notes from that as I did that's really time-consuming. Some people just listen to it over again but I found that I had to do that - to make the kind of notes that I wanted to make because I just couldn't keep up if I couldn't make notes. But I didn't feel too conspicuous about that because there were other people doing it as well.

Subject E: [I think it would be better if there were other people doing it, you see I'm the only person I'm sure in school that would do that. I just didn't feel right.

Examiner: I'm sure other people would benefit from it if they just knew about it. But it's something that a lot of people don't know about either. But I can understand your hesitancy to do it, because it kind of makes you stand out.

Subject E: I thought if other people would do it - I just don't know.] 37

Examiner: Yeah. I guess it's a point where doing it is more important than - you know, what other people think and that's to balance your strike for yourself, at sometime.

Subject E: That's true.

Examiner: O.K. But I understand that. I can understand.

Appendix Y

INTERVIEW REGARDING STUDY HABITS--

ANALYSIS STEP THRE (Subject E)

Meaning Units Restated as Themes

Subject E

Theme Number	Theme	Stimulus Question
1.	felt good to be told he had good intelligence even though he was told before	#1
2.	confirmed he wasn't stupid	
3.	his mother and a professional seen in about grade five had told him he was bright	#2
4.	had difficulty because of reading problems and hyperactivity	#3
5.	even now finds it hard to sit still	
6.	that his teachers don't understand his need to move	
7.	English is hard	#4
8.	Subject felt that he was at one time very good in Math but is no longer and feels the reading component may be a factor	
9.	Phys. Ed. is easy	
10.	Subject hated and hates Spelling; never did well especially in tests	
11.	people do well in school because it comes to them easily and they are naturally smart	#5
12.	it was difficult when his younger brother surpassed him in reading skills	
13.	panic when left on his own to do an assignment	#6
14.	hadn't done an essay for a long time	

15. mother helped Subject with his work - they found books and write the information down in her words

16. started early because he needed all the time he could get

17. got good marks on essays and liked doing them

18. finds needed information in books, dictionary, encyclopedia #7

19. use an encyclopedia like a dictionary, look up the topic

20. copy verbatim from encyclopedia or xerox.

21. go to the appropriate section of the library and take out a number of books on the topic

22. Subject gets a lot of information from pictures

23. uses a lot of pictures to illustrate reports

24. would use a book by looking up the topic in the back #8

25. sometimes S. thumbs through until he finds a picture

26. doesn't think he has ever been taught to use an index or Table of Contents in school

27. usually thumbs through a book to find information

28. can't remember workbook exercises on use of index or Table of Contents

29. for the first two years has done nothing to prepare for examinations because of his nervousness and feels much better #9

30. not studying brings him to the examination in a calmer state

31. is presently going over biology notes however as he is doing so badly

32. is reading over his notes and redoing assignments as well as going through the text (again mentioned pictures)

33. reads over material and repeats it

34. concentrating on spelling hampers his ability to take notes

35. listens in class and gets a friend's notes

36. has taped classes in the past (Gr. 10 and 11) but not presently

37. feels self conscious about taping; would feel better if others did it.

Appendix Z

INTERVIEW REGARDING STUDY HABITS -

ANALYSIS STEPS SIX THROUGH NINE (Subject E)

Note: Only responses to Questions 3, 4, 6, 7 and 9 were included in these analyses.

Themes Classified

Theme Number	Theme	Stimulus Question
	(Responses to Questions 1 and 2 not analyzed)	
4.	had difficulty because of reading problems and hyperactivity [knowledge of (specific)]	#3
5.	even now finds it hard to sit still [knowledge of (general)]	
6.	Agrees that his teachers don't understand his need to move [knowledge of (general)] agrees	
7.	English is hard [knowledge of (specific)]	#4
8.	Subject felt that he was at one time very good in Math but is no longer and feels the reading component may be a factor [knowledge of (specific)]	
9.	Phys. Ed. is easy [knowledge of (specific)]	
10.	Subject hated and hates Spelling; never did well especially in tests [knowledge of (specific)]	
	(Responses to Question 5 not analyzed)	
13.	panic when left on his own to do an assignment [knowledge of (general)]	#6
14.	hadn't done an essay for a long time [knowledge of (general)]	
15.	mother helped Subject with his work - they found	

books and wrote the information down in her words [knowledge of (specific)]

16. started early because he needed all the time he could get [regulation (planning)]

17. got good marks on essays and liked doing them [knowledge of (general)]

18. finds needed information in books, dictionary, encyclopedia [knowledge of (specific)] #7

19. use an encyclopedia like a dictionary, look up the topic [knowledge of (specific)]

20. copy verbatim from encyclopedia or xerox. [knowledge of (specific)]

21. go to the appropriate section of the library and take out a number of books on the topic[knowledge of (specific)]

22. Subject gets a lot of information from pictures [knowledge of (general)]

23. uses a lot of pictures to illustrate reports [knowledge of (general)]

(Responses to Question 8 not analyzed)

29. for the 1st two years has done nothing to prepare for examinations because of his nervousness and feels much better [knowledge of (general)] #9

30. not studying brings him to the examination in a calmer state [knowledge of (general)]

31. is presently going over biology notes however as he is doing so badly [knowledge of (general)]

32. is reading over his notes and redoing assignments as well as going through the text (again mentioned pictures) [knowledge of (specific)]

33. reads over material and repeats it [knowledge of (specific)] agrees

34. concentrating on spelling hampers his ability to take notes [regulation (monitoring)]

35. listens in class and gets a friend's notes (regulation (evaluation of effectiveness)]

36. has taped classes in the past (Gr. 10 and 11) but not presently [knowledge of (general)]

37. feels self conscious about taping; would feel better if others did it. [knowledge of (general)]